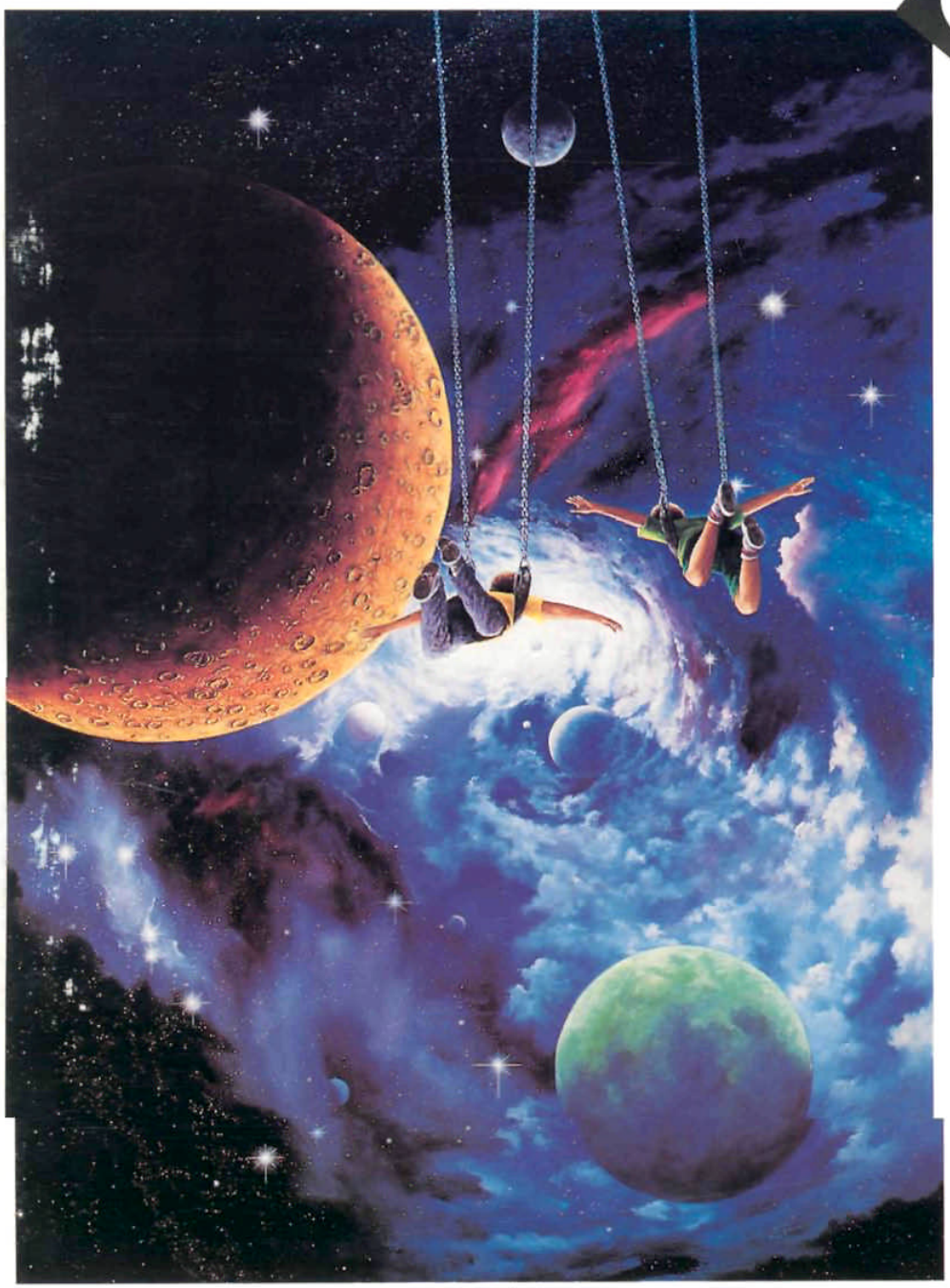
THE MAGAZINE FOR SCIENCE AND REASON

SKEPTICAL INQUIRER

Vol. 19, No. 1

Jan./Feb. 1995

U.S. $4.95
Can. $5.95



SPECIAL ISSUE

CARL
SAGAN
Wonder and Skepticism

RICHARD
DAWKINS
Growing Up in the Universe

FRANCIS
CRICK
The Astonishing Hypothesis

GLENN T.
SEABORG
Nuclear Medicine

MARTIN
GARDNER
Literary Science Blunders

AIR FORCE REPORT
On the Roswell Incident

STEPHEN BARRETT
On Linus Pauling

1994 CSICOP CONFERENCE
The Psychology of Belief

0 56698 80575 5

PUBLISHED BY THE COMMITTEE FOR THE SCIENTIFIC INVESTIGATION OF CLAIMS OF THE PARANORMAL

THE COMMITTEE FOR THE SCIENTIFIC INVESTIGATION OF CLAIMS OF THE PARANORMAL

Paul Kurtz, Chairman; professor emeritus of philosophy, State University of New York at Buffalo
Barry Karr, Executive Director and Public Relations Director
Lee Nisbet, Special Projects Director

FELLOWS

James E. Alcock,* psychologist, York Univ., Toronto
Robert A. Baker, psychologist, Univ. of Kentucky
Stephen Barrett, M.D., psychiatrist, author, consumer advocate, Allentown, Pa.
Barry Beyerstein,* biopsychologist, Simon Fraser Univ., Vancouver, B.C., Canada
Irving Biederman, psychologist, Univ. of Southern California
Susan Blackmore,* psychologist, Univ. of the West of England, Bristol
Henri Broch, physicist, Univ. of Nice, France
Jan Harold Brunvand, folklorist, professor of English, Univ. of Utah
Vern Bullough, Distinguished Professor, State Univ. of New York
Mario Bunge, philosopher, McGill University
John R. Cole, anthropologist, Inst. for the Study of Human Issues;
F. H. C. Crick, biophysicist Salk Inst. for Biological Studies, La Jolla, Calif.
Richard Dawkins, zoologist, Oxford Univ.
L. Sprague de Camp, author, engineer
Cornelis de Jager, professor of astrophysics, Univ. of Utrecht, the Netherlands
Bernard Dixon, science writer London, U.K.
Paul Edwards, philosopher, Editor, *Encyclopedia of Philosophy*
Antony Flew, philosopher, Reading Univ., U.K.
Andrew Fraknoi, astronomer, Foothill College, Los Altos Hills, Calif.
Kendrick Frazier,* science writer, Editor, SKEPTICAL INQUIRER
Yves Galifret, Exec. Secretary, l'Union Rationaliste
Martin Gardner,* author, critic
Murray Gell-Mann, professor of physics, Santa Fe Institute
Thomas Gilovich, psychologist, Cornell Univ.
Henry Gordon, magician, columnist, Toronto
Stephen Jay Gould, Museum of Comparative Zoology, Harvard Univ.
C. E. M. Hansel, psychologist, Univ. of Wales
Al Hibbs, scientist, Jet Propulsion Laboratory
Douglas Hofstadter, professor of human understanding and cognitive science, Indiana Univ.
Gerald Holton, Mallinckrodt Professor of Physics and Professor of History of Science, Harvard Univ.
Ray Hyman,* psychologist, Univ. of Oregon
Leon Jaroff, sciences editor, *Time*
Sergei Kapitza, editor, Russian edition, *Scientific American*
Philip J. Klass,* science writer, engineer
Marvin Kohl, professor of philosophy, SUNY at Fredonia
Edwin C. Krupp, astronomer, director, Griffith Observatory
Paul Kurtz,* chairman, CSICOP
Lawrence Kusche, science writer
Elizabeth Loftus, professor of psychology, Univ. of Washington
Paul MacCready, scientist/engineer, AeroVironment, Inc., Monrovia, Calif.
David Marks, psychologist, Middlesex Polytech, England
David Morrison, space scientist, NASA Ames Research Center
Richard A. Muller, professor of physics, Univ. of Calif., Berkeley
H. Narasimhaiah, physicist, president, Bangalore Science Forum, India
Dorothy Nelkin, sociologist New York Univ.
Joe Nickell,* author, technical writing instructor, Univ. of Kentucky
Lee Nisbet,* philosopher, Medaille College
James E. Oberg, science writer
Loren Pankratz, psychologist, Oregon Health Sciences Univ.
John Paulos, mathematician, Temple Univ.
Mark Plummer, lawyer, Australia
W. V. Quine, philosopher, Harvard Univ.
Milton Rosenberg, psychologist, Univ. of Chicago
Carl Sagan, astronomer, Cornell Univ.
Wallace Sampson, M.D., clinical professor of medicine, Stanford Univ.
Evry Schatzman, President, French Physics Association
Eugenie Scott, physical anthropologist, executive director, National Center for Science Education
Glenn T. Seaborg, University Professor of Chemistry, Univ. of California, Berkeley
Thomas A. Sebeok, anthropologist, linguist, Indiana Univ.
Robert Sheaffer, science writer
Dick Smith, film producer, publisher, Terrey Hills, N.S.W., Australia
Robert Steiner, magician, author, El Cerrito Calif.
Jill Cornell Tarter, SETI Institute
Carol Tavris, psychologist and author, Los Angeles, Calif.
Stephen Toulmin, professor of philosophy, University of Southern California
Marvin Zelen, statistician, Harvard Univ.
Lin Zixin, former editor, *Science and Technology Daily* (China)
*Member, CSICOP Executive Council
(Affiliations given for identification only.)

The SKEPTICAL INQUIRER (ISSN 0194-6730) is published bimonthly by the Committee for the Scientific Investigation of Claims of the Paranormal, 3965 Rensch Rd., Amherst, NY 14228-2713. Printed in U.S.A. Second-class postage paid at Amherst, New York, and additional mailing offices.

Inquiries from the media and the public about the work of the Committee should be made to Paul Kurtz, Chairman,CSICOP, Box 703, Amherst, NY 14226-0703. Tel.: (716) 636-1425. FAX: 716-636-1733.

Manuscripts, letters, books for review, and editorial inquiries should be addressed to Kendrick Frazier, Editor, SKEPTICAL INQUIRER, 944 Deer Drive NE, Albuquerque NM 87122-1306. FAX 505-828-2080.

Articles, reports, reviews, and letters published in the SKEPTICAL INQUIRER represent the views and work of individual authors. Their publication does not necessarily constitute an endorsement by CSICOP or its members unless so stated.

Copyright ©1995 by the Committee for the Scientific Investigation of Claims of the Paranormal. All rights reserved. The SKEPTICAL INQUIRER is available on 16mm microfilm, 35mm microfilm, and 105mm microfiche from University Microfilms International and is indexed in the *Reader's Guide to Periodical Literature.*

Subscriptions, change of address, and advertising should be addressed to: SKEPTICAL INQUIRER, Box 703, Amherst, NY 14226-0703. Old address as well as new are necessary for change of subscriber's address, with six weeks advance notice. SKEPTICAL INQUIRER subscribers may not speak on behalf of CSICOP or the SKEPTICAL INQUIRER.

Postmaster: Send changes of address to SKEPTICAL INQUIRER, Box 703, Amherst, NY 14226-0703.

SKEPTICAL INQUIRER
January/February 1995
Vol. 19 No. 1

FOR THE RECORD

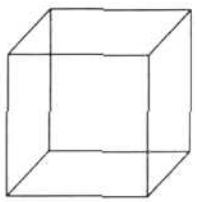
41 **The Air Force Report on the Roswell Incident**
The official Air Force findings from the reopened investigation of the Roswell Incident.

ARTICLES

24 **Wonder and Skepticism**
CARL SAGAN
Science requires an almost complete openness to all ideas. On the other hand, it requires the most rigorous and uncompromising skepticism.

31 **Putting Away Childish Things**
RICHARD DAWKINS
Gullibility, a childhood survival skill, is harmful for adults.

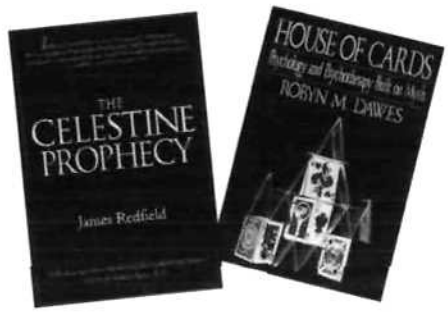
37 **Science, Soul, and the Astonishing Hypothesis**
FRANCIS CRICK
Is there some soul, or spirit, that science cannot explain that survives physical death? Or is it all in the brain?



39 **The Positive Power of Radioisotopes**
GLENN SEABORG
Radioisotopes have alleviated suffering and prolonged the lives of millions of human beings and contributed productively in many other ways.

BOOK REVIEWS

House of Cards by Robyn M. Dawes
SCOTT O. LILIENFELD 50
Selling Satan by Mike Hertenstein and Jon Trott
PETER HUSTON 52
Celestine Prophecy by Paul Redfield
JOE SZIMHART 54
NEW BOOKS/ARTICLES OF NOTE 56



Pauling's Legacy 18

Literary Science Blunders 14

ON THE COVER:
Space Race by Leonard Parkin

EDITOR'S NOTE KENDRICK FRAZIER 2
FROM THE CHAIRMAN PAUL KURTZ 3
NEWS AND COMMENT 5
Scientific Literacy / Ig Nobel Awards / AMA on Recovered Memories
APA on Facilitated Communication / Everyone Has a Theory
1994 CSICOP CONFERENCE
Exploring Mind, Memory, and Belief TOM GENONI, JR. 10
NOTES OF A FRINGE-WATCHER
Literary Science Blunders MARTIN GARDNER 14
HEALTH WATCH
The Dark Side of Linus Pauling's Legacy STEPHEN BARRETT 18
PYSCHIC VIBRATIONS
The Non-amazing Kreskin Flubs Again ROBERT SHEAFFER 21
MEDIA WATCH
Showtime's *Roswell* C. EUGENE EMERY, JR. 22
FORUM
Letter to a Friend ROBERT ESTLING 59
LETTERS TO THE EDITOR 65

SKEPTICAL INQUIRER

EDITOR
Kendrick Frazier

EDITORIAL BOARD
James E. Alcock
Berry Beyerstein
Susan J. Blackmore
Martin Gardner
Ray Hyman
Philip J. Klass
Paul Kurtz
Joe Nickell
Lee Nisbet
Béla Scheiber

CONSULTING EDITORS
Robert A. Baker
William Sims Bainbridge
John R. Cole
Kenneth L. Feder
C.E.M. Hansel
E.C. Krupp
David F. Marks
Andrew Neher
James E. Oberg
Robert Sheaffer
Steven N. Shore

MANAGING EDITOR
Doris Hawley Doyle

ASSISTANT EDITOR
Thomas C. Genoni, Jr.

CONTRIBUTING EDITOR
Lys Ann Shore

PRODUCTION
Paul Loynes

CARTOONIST
Rob Pudim

PUBLISHER'S REPRESENTATIVE
Barry Karr

BUSINESS MANAGER
Mary Rose Hays

ASSISTANT BUSINESS MANAGER
Sandra Lesniak

CHIEF DATA OFFICER
Richard Seymour

FULFILLMENT MANAGER
Michael Cione

STAFF
Elizabeth Begley
Kevin Iuzzini
Diana Picciano
Alfreda Pidgeon
Etienne C. Ríos
Ranjit Sandhu
Sharon Sikora
Vance Vigrass

DESIGNER
Peters & Company

The SKEPTICAL INQUIRER is the official journal of the Committee for the Scientific Investigation of Claims of the Paranormal, an international organization.

Editor's Note

A Welcome

To our subscribers, yes, this is the magazine you know. It's just in a new, larger package. As I previously (Fall 1994) noted would happen, with this first issue of 1995 we have increased the frequency of the SKEPTICAL INQUIRER (now subtitled The Magazine for Science and Reason) *to bimonthly and expanded our size to a standard magazine format. From now on we'll be able to provide you more editorial material and in a timelier fashion than ever before.*

To readers new to us—and this issue will reach a vastly larger audience —welcome. We are a new kind of magazine. I think you are in for a treat, an intellectual feast. And not just in in this particular issue, with its articles by such scientific luminaries as Carl Sagan, Richard Dawkins, Francis Crick, Glenn Seaborg, and Martin Gardner, but in all those to follow. We are published by a noted nonprofit scientific and educational organization, the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP), and for this special issue, the authors are all Fellows of CSICOP. (Fellows and Scientific Consultants are listed on the inside covers.)

For 18 years, CSICOP and the SKEPTICAL INQUIRER *have brought a responsible, scientific viewpoint to evaluating a diverse array of popular (and often controversial) claims and perceptions. We try to help distinguish science from nonscience, real science from pseudoscience, and good science from bad science. We aggressively seek good information to replace misinformation, and we explore in depth the scientific, social, and educational issues surrounding these matters. At the same time we share with all scientists a delight and awe at the true wonders and mysteries of nature (including the human mind and behavior) and the challenges of exploring them. Although fiercely independent, we have widespread support from distinguished scientists, scholars, and citizens worldwide.*

We value science, curiosity, love of learning about the natural world, and critical thinking. We especially value the complex and innovative strategies science has developed for advancing our understanding and sifting through competing claims to knowledge. Always we seek to find what best stands the test of evidence. And in the spirit of science, all judgments are tentative and open to revision whenever new or better evidence arrives.

We welcome you to this quest, and promise it will be exciting and invigorating. You are a part of it too, and your suggestions will help shape future directions.

From the Chairman

PAUL KURTZ

New Departure for the Skeptical Inquirer

This issue of the SKEPTICAL INQUIRER marks a new departure for the Committee for the Scientific Investigation of Claims of the Paranormal, and it portends new opportunities for the growth of the skeptical movement worldwide. By expanding its frequency and providing a larger format, we hope to increase the readership of the SKEPTICAL INQUIRER. These changes have already translated into increased circulation—67,500 copies of this issue—primarily in bookstores and on newsstands. But we need to intensify our efforts if we are to increase our subscriber base. We hope that you—our loyal readers—will help us in this regard, by getting your friends, colleagues, relatives, and local libraries to subscribe. You can also help us by persuading your bookstore or newsstand to carry the SKEPTICAL INQUIRER.

The SKEPTICAL INQUIRER is unique. It has in its brief history become the major scientific opposition to the vast tide of paranormal and pseudoscientific claims that floods the larger culture. We still feel like a lone voice in the wilderness as we continue to demand that these unexamined claims be tested.

When CSICOP was founded 18 years ago, little did we imagine that it would receive such a positive reception from thoughtful persons in the scientific community and elsewhere who were skeptical of psychic phenomena, astrology, ufology, homeopathy, and the newer, bizarre beliefs of the New Age. Nor did we imagine that paranormal claims would continue to proliferate throughout the world—from North America to Europe, from Australia to Asia and Africa.

The paradox is that at the same time that science and technology continue to make progress, offering unparalleled promises for the improvement of the human condition—in medical and biogenetic research, computer technology, space exploration, and astronomy, to mention only a few of the many frontiers of expanding knowledge—the current of pseudoscientific beliefs becomes stronger. Of particular concern is that the media of communications pander to public gullibility and that the media conglomerates are often more interested in entertainment than in conveying information and knowledge to the public.

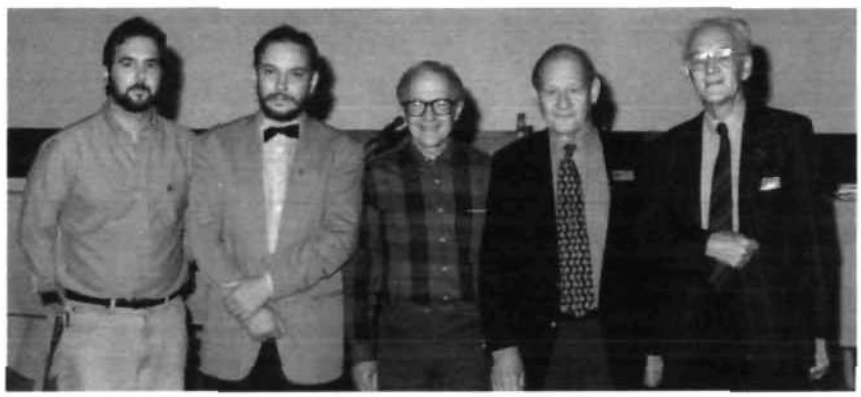
We need to convince General Electric (which owns NBC), Rupert Murdoch (Fox), Time-Warner, Viacom-Paramount, Bertelsmann, and the other multimedia corporations that control publishing, television, and motion pictures that their future, like ours, depends on the growth of science and technology and that they have a responsibility to transmit to the general public an understanding of the scientific outlook and the methods of scientific inquiry. Similarly, college and university faculties, too many of which pander to every wave of intellectual fashion, often forget the need to educate students about science and critical thinking.

In any case, I would like to say how pleased CSICOP is to present this new, expanded SKEPTICAL INQUIRER and to thank our indefatigable editor, Kendrick Frazier, for all he has done to make this possible.

And thank you, our readers, for helping to make the SKEPTICAL INQUIRER and CSICOP so relevant and vital. We have no governmental or foundation grants and no advertising revenue, and must depend on your continued encouragement and support, for which we are sincerely grateful.

European Council of Skeptical Organizations Established

I recently attended, with Barry Karr, executive director of CSICOP, and Executive Council member Ray Hyman,



(*left to right*) **Barry Karr, Tim Trachet, Ray Hyman, Paul Kurtz, and Cornelis de Jager at the Sixth European Skeptics Conference.**

the Sixth European Skeptics conference, which was held in the beautiful Belgian coastal city of Ostende. The main theme of this conference was "Pseudoscience and the Environment." It was attended by skeptics from all over Europe. Virtually all of the major European countries now have skeptical organizations that publish newsletters and magazines and attempt to provide evaluations of paranormal and pseudoscientific claims. Recognizing the similar problems faced throughout Europe, and given the emergence of the European Parliament and the European Commission, the decision was made to form a "European Council of Skeptical Organizations" (ECSO). The group was officially inaugurated in the resplendent town hall with the mayor of Ostende presiding. The president of ECSO is Cornelis de Jager, the distinguished astronomer from the Netherlands. The key contact person in Brussels will be Tim Trachet. CSICOP is glad to welcome ECSO as a vital member of the world skeptical community.

French Committee Announces Results of Test of the So-Called Mars Effect

At the European Skeptics Conference, the French Committee for the Study of Paranormal Phenomena (CFEPP) announced the tentative results of its effort to replicate the "Mars effect." A paper was read by Jean-Paul Krivine outlining these results.*

*Members of the French Committee who worked on this report were Claude Benski, Dominique Caudron, Yves Galifret, Jean-Paul Krivine, Jean-Claude Pecker, Michel Rouze, and Evry Schatzman.

Paul Kurtz, professor emeritus of philosophy at the State University of New York at Buffalo, is founding chairman of the Committee for the Scientific Investigation of Claims of the Parnormal.

Perhaps no inquiry has evoked more controversy between skeptics and astrologers than the efforts by the scientific community to test the claims of French authors Michel and Françoise Gauquelin. Although critics of traditional astrology, the Gauquelins claimed to have found a correlation between planetary positions, birth data, and personalities and achievements. They claimed to find correlations between Saturn and scientists, Jupiter and military men, Mars and sports champions, and so on. It is the Mars and sports champions hypothesis, for which the Gauquelins claimed to have found the highest correlation to support their astrobiology, that has been put to the test by various scientific groups throughout the world.

"The Gauquelins claimed to have found correlation between planetary positions, birth data, and personalites and achievements."

Gauquelin had assembled data for 2,088 sports champions in Europe, most of them in France. He divided the sky into 12 sectors through which Mars appears to pass as it orbits the sun. He claimed that sports champions were born in the first sector (when Mars is rising) and the fourth (its culmination) beyond chance expectations. In 1967 the Para Committee in Belgium carried out a test of 535 sports champions. Gauquelin maintained that the results were positive for the "Mars effect," but the Para Committee claimed that the results were ambiguous, for three reasons: (1) although the key sectors came out as Gauquelin had predicted, the remaining ten sectors were not what chance or Gauquelin had predicted, and therefore (2) a bias may have crept into the data selection. Finally (3), the key sector results may have been due to a random fluctuation in the theoretical curve.

Marvin Zelen, now a professor of statistics at Harvard, proposed a test of nonchampions in 1976 to test for the third of the three objections. Gauquelin performed the experiment and reported that nonchampions were born at about the chance rate of 17.17 percent. Champions, he alleged, were born at approximately 22 percent in the first and fourth sectors. The Zelen test caused considerable controversy about the interpretation of the results. Kurtz, Abell, and Zelen conceded possible errors in their interpretation, but they remained skeptical of the way the Gauquelins had conducted the test, since they had deviated from the protocol. Inasmuch as the Gauquelins not only were the proposers of the hypothesis, but were responsible for assembling the data, some question of bias in selecting the data could be raised, Kurtz, Abell, and Zelen said. The major findings of the Mars effect were based on a European—primarily French—sample, most of the data having been compiled by the Gauquelins.

Kurtz, Abell, and Zelen then proposed an independent test of American champions. They conducted a test with a sample of 408 champions and their findings were reported in the SKEPTICAL INQUIRER (Winter 1979–80). The results were negative, with only 13.5 percent being born in the first and fourth sectors.

The Gauquelins immediately disputed these results, insisting that the Mars effect only applied to "the most famous internationally recognized champions" and that these were not sufficiently represented in the American test sample. Analyzing the data post hoc, they claimed to find a smaller sample with significant results. Kurtz, Abell, and Zelen contested their claims, maintaining that their own sample of sports champions was selected from the major *Who's Whos* of sports champions in the United States.

In 1979 Michel Gauquelin attempted still another replication, with 438 European sports champions, claiming again to find significant results, although Kurtz, Abell, and Zelen pointed out that he did not use the same criteria in the French study as he had insisted upon in the American study. Gauquelin said that he had deleted 423 "lesser" champions from his study. The key issue turned on who was "famous" or "lesser." Moreover, the arbitrary crite-

Chairman continued on page 62

News and Comment

Science Literacy: The Good News and the Bad

According to the findings of a recent study by the National Assessment of Educational Progress, students are doing better in math and science a decade after the 1983 "Nation at Risk" report described a "rising tide of mediocrity" in American education.

The new report said that, in general, 9-, 13-, and 17-year-olds showed a better understanding of math and science fundamentals in 1992 than students in the same age group did in the 1970s. However, students were found to be only at or slightly above where they were 20 years ago, and reading and writing skills have essentially been stagnant.

According to the findings, 78 percent of 9-year-olds understood simple scientific principles and knew some facts about plants and animals, up from 68 percent in 1977. Among 13-year-olds, 61 percent in 1992 understood and were able to apply general information about the life and physical sciences, up from 49 percent in 1977.

Math skills also increased. In 1992, 28 percent of 9-year-olds were able to add, subtract, multiply, and divide using whole numbers, up from 20 percent in 1978. The abilities of 17-year-olds also rose in that area, from 92 percent to 97 percent in the same time period.

In addition, the study found that students have been taking more rigorous courses in both math and science. Increases in student enrollment in biology, chemistry, and physics classes were noticed. And interestingly, in 1992, 76 percent of 17-year-olds said science should be a required subject, up from 62 percent in 1977.

The study found that, in overall student achievement, boys generally scored higher than girls in math and science, while girls performed better in reading and writing. The report also found that there still is a large achievement gap between white and minority students, despite a slight narrowing.

In contrast to the encouraging results of the National Assessment of Educational Progress study, a recent survey conducted by the American Museum of Natural History (AMNH), in New York City, revealed that Americans' understanding of the natural and physical world remains low.

The survey—titled "Science and Nature Survey"—consisted of telephone interviews with 1,255 adults from across the country. The respondents were asked a series of true-false and multiple-choice questions to determine their general attitude toward science and to measure their understanding of various scientific topics.

Although many respondents expressed an interest in science, the study resulted in some rather disturbing statistics. For instance, 46 percent of respondents do not believe that humans evolved from earlier species of animals, 65 percent do not know how many planets are in the solar system, and 87 percent cannot identify the cause of the ozone layer. Other recent surveys have documented similar findings.

While most researchers found the results distressing, Mary Woolley, president of Research!America, says that capitalizing on the public's high opinion of science should be a priority. "The attitudes are positive, the interest is there."

Ellen V. Futter, president of the American Museum of Natural History, also noted some positive aspects in the results, stating that the public has "an acute recognition of the importance of science and a healthy respect for the potential negative consequences and abuse of scientific research." However, Futter found it "paradoxical" that during the literacy portion of the study, the public would demonstrate misconceptions about some things and express a relatively clear understanding of others.

Literacy experts believe that even though interest in science is high, people still feel distanced from science. The AMNH study found that while 68 percent agreed with the statement "Science will solve many of the world's problems," 51 percent also agreed with the statement "I understand less and less of what scientists are doing today." Similarly, the most recent "Science Indicators" report said that only one of every ten adults considered himself or herself well-informed about new scientific discoveries or use of new inventions and technologies.

"The point of all this is that science is perceived as remote from and inaccessible to nonscientists. Science is not for experts only," said Futter.

• • •

Despite the revealing information these science-literacy studies have produced, some researchers believe that too little effort has been spent on ascertaining what people know about the scientific method. Bruce Fuchs, an assistant professor of pharmacology at the Medical College of Virginia, Richmond, said: "One thing that does concern me—and I don't see this survey getting at this—is that I think people really need to understand the process of science rather than some of these facts." Fuchs added that this kind

of knowledge is important so that people can evaluate what they read about scientific controversies.

Don Herbert—also known as "Mr. Wizard"—has been combatting the problem of scientific illiteracy for more than 40 years with his hands-on science television shows and believes that it is the teaching techniques, not the students, that are to blame for America's lagging scientific awareness. "I don't think it's a reflection of the kids at all. I think it's been the method of presenting science," Herbert said.

How should we tackle the problem? Thomas J. Hoban, an associate professor of sociology and anthropology at North Carolina State University in Raleigh, concludes that it is up to scientists to popularize science: "Because scientists can influence people's impressions, they really need to take responsibility for getting out there and trying to help demystify science."

—Tom Genoni, Jr.

The AMA Issues Policy on Recovered Memories

The Summer 1994 issue of *SI* reported on the American Psychological Association's statement on the "recovered memory" debate. Recently, the American Medical Association issued a statement that outlines its position on this controversial subject.

The AMA policy touches on a number of areas in which the issue of repressed memories has become a concern. The AMA notes that numerous lawsuits have been filed based solely on recovered memories and that the current legal standards in these cases vary from state to state. For instance, although California has adopted new laws that prevent plaintiffs from prevailing in the absence of evidence beyond the recovered memories, Illinois, in contrast, has recently extended the statute of limitations for filing such suits.

The concerns of the AMA deal primarily with the role of the therapist. The AMA states: "It is well established that a trusted person such as a therapist can influence an individual's reports, which would include memories of abuse." It also states that "other research has shown that repeated questioning may lead individuals to report events that in fact never occurred." However, the AMA also cites a study by L. M. Williams as an example of positive evidence for the existence of recovered memories and adds: "There are other instances in which recovered memories proved to be correct."

In the AMA's Conclusions and Recommendations, it affirms that "it is not yet known how to distinguish true memories from imagined events in these cases. The AMA considers the technique of 'memory enhancement' in the area of childhood sexual abuse to be fraught with problems of potential misapplication." The statement also encourages physicians dealing with possible adult victims of childhood abuse to subscribe to the Principles of Medical Ethics with particular attention paid to the annotations applicable to psychiatry.

The False Memory Syndrome Foundation, a watchdog organization, has repeatedly called for critical examinations of "recovered" memories and, in its most recent newsletter, commented on the AMA statement with special emphasis on the purported positive results of Williams's research. The newsletter quotes a section of a paper by Loftus, Polonsky, and Fullilove that takes issue with the findings of the Williams study. "[Williams's] 38 percent figure has been taken as evidence for the prevalence of repression, but this conclusion is unwarranted. For some percentage of victims, the abuse would have happened so early in life ... that as adults they would not be expected to remember the experience no matter whether it was abuse or some other experience."

Both the AMA and the False Memory Syndrome Foundation will continue to monitor developments in this area.

—Tom Genoni, Jr.

Facilitated Communication Scientifically Invalid, APA Says in Statement

The American Psychological Association (APA) has adopted the position that facilitated communication is a controversial and unproved communication procedure with no scientifically demonstrated support for its efficacy. Facilitated communication is a process by which a facilitator supports the hand or arm of a communicatively impaired individual while he or she spells out a message using a keyboard or typing device.

Two evaluative articles on this subject in the Spring 1993 SKEPTICAL INQUIRER found that facilitated communication was based on emotional appeals and questionable science, and that its scientific claims had not been validated—in fact, they had been contradicted. Numerous other investigations have confirmed that judgment.

Nevertheless the technique has been adopted throughout North America in special/vocational education services for nonverbal persons with developmental disabilities. A basic premise of facilitated communication is that people with autism and moderate or profound mental retardation have "undisclosed literacy" consistent with normal intellectual functioning. Proponents claim that this process enables persons with autism or mental retardation to communicate.

However, noted the APA in a statement issued August 24, 1994, scientifically based studies have repeatedly demonstrated that this is not a valid technique for individuals with profound developmental disabilities.

"From a scientific standpoint," said Brian A. Gladue, senior scientist for the APA, "the overwhelming evidence arguing against the wide and vast claims of facilitated communication is more than compelling. And this resolution by APA is yet another example of how scientists and practitioners in psychology work together on issues that serve the best public interest."

Furthermore, the APA stated that

taking action based on nonverbal accusations, through facilitated communication, of abuse or mistreatment by family members or other caregivers could contribute to threats to the civil and human rights of the person with autism or severe mental retardation as well as of those accused. It said that instances have been widely noted of facilitated communication eliciting otherwise unsubstantiated allegations of abuse, leading to psychological distress, alienation, or financial hardship of family members and caregivers.

James Mulick, professor of pediatrics and psychology, Children's Hospital, Columbus, Ohio, said in the APA statement: "The most serious problem with facilitated communication is that people using it are susceptible to a strong illusion of communication where, in fact, there is none. Psychologists are now in a much better position to help and protect people with autism and severe mental disability from being misused and inappropriately influenced by this false training technique." Mulick has been active in investigating the claims of facilitated communication and was lead author of the main SKEPTICAL INQUIRER article.

The APA said the experimental and unproved status of the technique does not preclude continued research on the utility of facilitated communication and related scientific issues. "Judicious clinical practice involving use of facilitated communication should be preceded by the use of fully informed consent procedures, including communication of both its potential risks and benefits," said the APA.

The American Speech-Language-Hearing Association (ASHA) has drafted a position statement likewise declaring that facilitated communication "has no scientific validity or reliability."

Ig Nobel Awards Go to the Most Deserving

L. Ron Hubbard, science-fiction author and founder of a religious empire known as Scientology, was awarded the Ig Nobel Prize in Literature October 6 in a traditionally chaotic ceremony at the Massachusetts Institute of Technology.

Hubbard, cited "for his crackling Good Book, *Dianetics,* which is highly profitable to mankind or to a portion thereof," did not appear in person to accept the award.

One reason: Hubbard is dead.

The other reason: This is, after all, the Ig Nobels.

The ignominious Ig Nobels, purportedly named after the legendary Ignatius Nobel, are the least-coveted prizes in all of science and the comic counterpart to the Nobel Prizes. They are presented each year "to individuals whose achievements cannot or should not be reproduced."

Past laureates of interest to SKEPTICAL INQUIRER readers have included Erich Von Däniken, whose *Chariots of the Gods* explained how human civilization was shaped by ancient astronauts, and Harvard University psychiatrist John Mack, who has gained fame by concluding that people who believe they were kidnapped by space aliens probably were.

Among the other winners of the 1994 Fourth Annual Ig Nobel Prizes, based on votes compiled by the accounting firm of Howard, Fine and Howard, were:

• The Southern Baptist Church of Alabama, "mathematical measurers of morality," whose members won the Ig Nobel in Mathematics "for their county-by-county estimate of how many Alabama citizens will go to Hell if they don't repent."

• W. Brian Sweeney, Brian Krafte-Jacobs, Jeffrey W. Britton, and Wayne Hansen, who shared the Ig Nobel in Biology for their breakthrough study, "The Constipated Serviceman: Prevalence Among Deployed U.S. Troops," published in the August 1993 issue of *Military Medicine.*

• Veterinarian Robert A. Lopez of Westport, N.Y., who garnered the Ig Nobel in Entomology "for his series of experiments in which he obtained ear mites from cats, inserting them into his own ear and carefully observing and analyzing the results."

• Lee Kuan Yew, former prime minister of Singapore, who got the Ig Nobel in Psychology "for his 30-year study of the effects of punishing three million citizens of Singapore whenever they spat, chewed gum, or fed pigeons."

• John Hagelin of Maharishi University and The Institute of Science, Technology and Public Policy, "promulgator of peaceful thoughts," who earned the Ig Nobel Peace Prize "for his experimental conclusion that 4,000 trained meditators caused an 18 percent decrease in violent crime in Washington, D.C."

• The Japanese Meteorological Agency, which earned the Ig Nobel in Physics "for its seven-year study of whether earthquakes are caused by catfish wiggling their tails."

• Bob Glasgow of the Texas State Senate, who tried to outlaw the purchase of beakers, flasks, test tubes, and other laboratory glassware without a license. He won the Chemistry prize.

• Jan Pablo Davila of Chile, "tireless trader of financial futures and former employee of the state-owned Codelco Company," who garnered the Ig Nobel in Economics "for instructing his computer to 'buy' when he meant 'sell,'" and whose subsequent economic bungling eventually lost 0.5 percent of Chile's gross national product.

This year's Ig Nobel Prize in Medicine came in two parts.

The first went to Patient X, a former U.S. Marine, who was bitten by a pet rattlesnake and decided to treat himself with electroshock therapy. "At his own insistence," the citation says, "automobile sparkplug wires were attached to his lip and the car engine revved to 3,000 rpm for five minutes."

The other half of the prize went to Richard C. Dart of the Rocky Mountain Poison Center and Richard A. Gustafson of the University of Arizona Health Sciences Center "for their well-grounded medical report: 'Failure of Electric Shock Treatment for Rattlesnake Envenomation.'"

The Ig Nobel Laureate Address was given by James Knowlton, winner of

the 1992 Ig Nobel Prize in Art for his classic anatomy poster, "Penises of the Animal Kingdom." His topic: "Onward and Upward."

Included in the 1994 ceremony were the usual designated hecklers, a performance of the new musical composition "Cymbalic Duet in B# Major, Opus 3," and the traditional whistle-blowing referee who kept the annual Heisenberg Certainty Lectures to less than 30 seconds.

The awards were co-sponsored by the MIT Museum and the *Annals of Improbable Research (AIR)*, a journal of offbeat pseudoscientific studies (the kind skeptics would appreciate) published by the former staff of the *Journal of Irreproducible Results* (*JIR*). The staff quit *JIR* and created *AIR* last year because, according to sources, the publisher of *JIR* was found to have no sense of humor.

—*Eugene Emery, Jr.*

Gene Emery is the science writer for the Providence Journal, *75 Fountain St., Providence, RI 02902.*

Everyone Has A Theory! How Do You Respond?

It's a familiar scenario for an editor. Your newspaper/magazine/journal publishes an article about the latest scientific finding in cosmology. Soon you begin receiving letters from readers outlining their own cosmological theories of the universe. Often these messages go on for pages in painstaking detail. And although they're by nonscientists, their language can be just as opaque as the most technical published papers. Most of these letters are by sincere people motivated by the same curiosity and interest that drives good scientists. But some are by people who seem to have giant chips on their shoulders, hostile to science and all scientists for refusing to recognize their cosmic insights. How should you respond? Every editor has to make a choice.

Here's how Keay Davidson, science reporter for the San Francisco Examiner, *responded recently to one such letter writer. (Davidson is a former recipient of CSICOP's Responsibility in Journalism Award.)*

Dear _____:

Thanks for your letter. I'm not an astrophysicist, so anything I say about your theory is of little value. . . . [Davidson does make a few brief comments, showing that the man's idea was long ago considered.]

. . . Regarding your question, "Why can't I get published?": You tell me you're not a scientist; I presume, then, that you have no significant training (e.g., leading to an advanced degree) in math, physics, astronomy, etc. You also tell me that you're miffed by science journals that ignore your work.

Well, what on earth did you expect? In my view, no one without substantial training in, or knowledge of, astrophysics should publish in astrophysics journals. If that sounds fantastic, so be it! You wouldn't want someone untrained in heart surgery to perform heart surgery on you, would you? Or an unlicensed plumber to fix your plumbing?

Science is extremely hard work, and scientists have learned something few laypeople appreciate—that the Truth is a terribly elusive beast to chase down; it's a business for competent professionals, not for armchair science buffs.

This doesn't mean you aren't free to speculate! This is America, and there is no Lysenkoism here (although it has reared its hideous head from time to time); no one requires you to accept the prevailing cosmology. The First Amendment rightly protects your freedom to hold any views you wish, and to express them in any place that offers you a forum.

But the glorious First does not require science journals to open their pages to every untrained newcomer who propounds a grand, vague hypothesis, especially when publishing costs are so high and when so many competent professionals are standing in line to get their work published. Otherwise the biology journals would be packed with articles by creationists, the geophysics journals with articles by Flat Earthers, etc. You can't expect science journals to take you seriously when your credentials are nonexistent.

Also: If you want science writers to take you seriously, I strongly urge you (1) not to plead for their help, and (2) not to compare yourself to poor Galileo. Science writers rarely are impressed by written appeals from laypeople who claim they've been "oppressed" by the "scientific establishment"; we're only impressed by articles in legitimate science journals. Most of us (including me) are not scientists, so we rely on the science journals (and interviews with scientists) to give us a good idea of what's legitimate and what isn't.

As for (2): Every letter-writing crank who has "invented" a perpetual-motion machine compares himself to Galileo. Need I remind you that Galileo was a professional scientist, highly skilled in math and experimentation. Besides, he was oppressed by theologians, not by scientists.

To make a long rant short: If you don't have training in astrophysics (or any other technical subject) and want to publish articles about it in peer-review journals, then get the training. Go back to school, learn how to conduct experiments, get a doctorate, etc. Otherwise, no one will take your speculations seriously—except your family, friends and, perhaps, the grocery-store tabloids.

Sorry to speak so bluntly, but I get letters like yours all the time. I hope this letter has given you food for thought. And I sincerely wish you the best of luck.

Let me know if you get that doctorate.

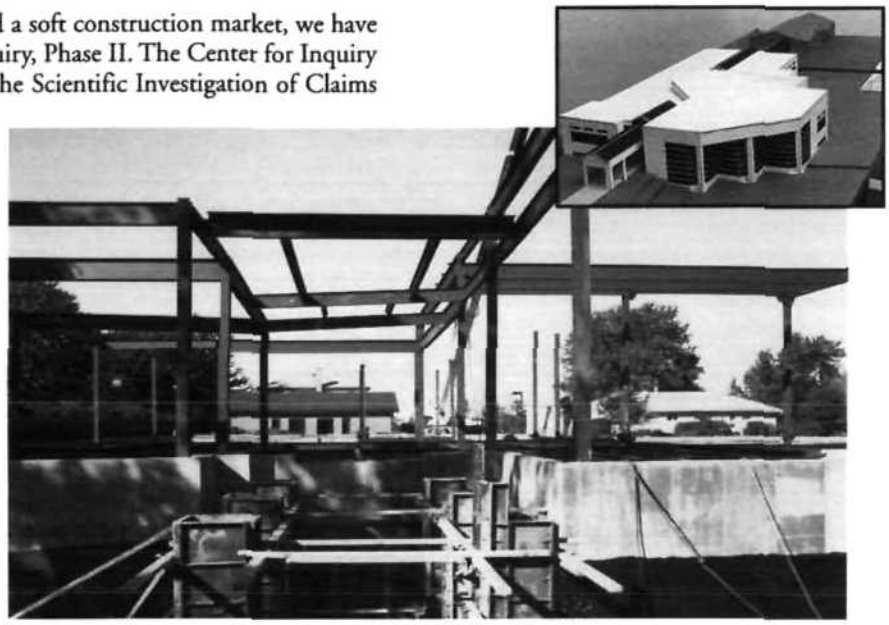
Sincerely,

Keay Davidson
Science Writer
San Francisco Examiner

Headquarters Campus for CSICOP and the Skeptical Inquirer

A Progress Report

Taking advantage of low-interest rates and a soft construction market, we have begun construction of the Center for Inquiry, Phase II. The Center for Inquiry is the headquarters of the Committee for the Scientific Investigation of Claims of the Paranormal and the Council for Democratic and Secular Humanism (CODESH), with which for economic reasons CSICOP has shared facilities since 1980.



This is the long-awaited consolidation of SKEPTICAL INQUIRER's Buffalo-area administrative, editorial, production, and warehousing activities in one efficient facility.

Ground-breaking was in late May 1994, and the plan is for occupancy in early 1995.

Located adjacent to the Amherst Campus of the State University of New York at Buffalo—the largest campus of the nation's largest state university system—the Center for Inquiry will provide the permanent, multi-purpose home base that the skeptical movement has long required.

Numerous opportunities exist for naming rooms and structures after friends or loved ones. The Phase II building of the Center for Inquiry itself remains to be named for a gift of $1,000,000; the Computer Center, for a gift of $250,000.

Construction Cash Is Still Short

We will realize important savings by having started construction this summer, although our "Price of Reason" Capital Fund Drive is still in progress. Under Co-Chair Martin Gardner this campaign has reached more than 85 percent of the CSICOP/CODESH construction and endowment goals. To maintain our momentum, additional cash gifts for construction are urgently needed.

Martin Gardner

Please support the "Price of Reason" Capital Fund Drive today. For more information, use the postpaid response card in this issue or contact CSICOP today at 716-636-1425.

Construction Now Under Way!

- New building on two floors, expandable for the future
- Eye-catching new contemporary design
- Will house the world's largest skeptical library—computerized catalogue accessible via modem from anywhere in the world
- Conference and seminar facilities, with full audio-visual support
- Dedicated audio-video-TV production and duplication facility. For larger productions, multimedia conference room converts to 3-camera television studio.
- Additional, efficient office space to provide for CSICOP's past and future growth

Exploring Mind, Memory, and the Psychology of Belief

TOM GENONI, JR.

The 1994 CSICOP conference, held in Seattle, Washington, June 23 to 26, set out to explore the various ways in which our minds operate, how our views are formed, and how our memories can be influenced, altered, and even manufactured. Titled "The Psychology of Belief," this lively four-day event, attended by more than 700 people from around the United States and abroad, featured sessions on UFOs and alien abductions, the highly controversial recovered-memory debate, expert testimony and pseudoscience in the courtroom, and conspiracy theories. There was also an unannounced visit from James Randi, who showed a videotape of his latest adventure in Australia accompanied by his always nimble-witted commentary. The highlight of the conference was the keynote address by Carl Sagan, who emphasized the need to popularize science and the potentially dangerous consequences of a society in which scientific understanding is in the hands of the few. (See his article in this issue.) But it was the first session, with Harvard professor of psychiatry John Mack discussing alien abductions, that created the most controversy.

Harvard professor John Mack defending his belief that aliens have abducted many of his patients.

Alien Abductions: Confrontation, Controversy

Robert Baker, professor emeritus of psychology at the University of Kentucky, began the session by stating his position that almost all so-called UFO abductions are primarily a psychological phenomenon resulting from hypnotherapy. Regressive hypnosis, Baker contends, is an unreliable procedure because it unlocks the patient's imagination: "Once you turn on the imagination, all things are possible." Baker also said that sleep paralysis—a condition that can occur in the period between sleeping and waking—accompanied by hypnagogic and hypnopompic hallucinations, can produce bizarre effects that may account for the vivid alien encounters so many have reported. Not only can these "waking dreams" result in startling apparitions, but they may also produce a range of physiological symptoms, including heightened audio perception, sensations of floating or falling, and even the feeling that some device has been implanted somewhere in the body. Although the predictability is low and the exact causes of such sleep disorders are not known—stress is believed to be a primary contributor—Baker reported that 4 to 5 percent of the American population have had such experiences on one or more occasions in their lives. Baker said that, except for variations in the hallucinatory content, the descriptions given by known sleep-paralysis patients are almost identical to the accounts of alleged alien abductees.

Although somewhat in agreement with Baker and other skeptics that UFO-abduction stories are difficult to accept, Thomas Bullard, folklorist at Indiana University, said that the abduction phenomenon is "an anomaly worth investigating." He said that there is an unusually high degree of consistency in the abductees' descriptions not only of the aliens (short, humanoid figures with large heads) but also of the sequence of events that occur during the alleged abductions. In a brief slide presentation, Bullard demonstrated

that early representations of aliens varied considerably, while more recent images have had a high degree of consistency. He also disputed the claim, alluded to by Baker, that the 1977 movie *Close Encounters of the Third Kind* provided the model for the alien figure. He said that, of the 103 cases in his study, more than half of the 43 that had been published prior to the release of that movie contained descriptions of short, humanoid figures. Bullard maintained that there are too many experiences that cannot be easily explained through standard methods and urged skeptics to examine and investigate these UFO claims. (During the question-and-answer period, however, Baker pointed out that the burden of proof is not on the skeptics, but on those who are making these extraordinary claims.)

Robert Baker discusses his earthbound explanations for the alien abduction phenomenon.

John Mack, professor of psychiatry at Harvard University, drew the most attention and curiosity from the audience. His recent book, *Abduction: Human Encounters With Aliens*, in which he proclaims the belief that many of his patients actually have been abducted by aliens, has received extensive media coverage. Indeed, Mack is now the most visible spokesman for the abduction phenomenon. He maintains he was once intensely skeptical of such claims but now categorizes the UFO-abduction cases as "authentic mysteries." He said he has considered other possible causes (i.e., sleep paralysis, nightmares), but the UFO-abduction cases have "a quality of their own."

But Mack did not simply defend his position that, based on his anecdotal evidence, aliens have visited the planet. He also posed some questions regarding the polarization of skeptics and believers. Asking the audience to consider the question "What is the appropriate epistemology?" Mack said that this phenomenon may be inviting us to stretch our system of understanding realities. "Other cultures have always known that there were other realities, other beings, other dimensions. There is a world of other dimensions, of other realities that can cross over into our own world." Which realities, beings, and dimensions, he did not say.

In closing, Mack asked why skeptics are so vehement in their attacks and wondered how they can have so much certainty. "Are we seeking to be the arbiters of reality?" he asked. CSICOP Chairman Paul Kurtz, moderator of the session, briefly responded that skeptics are simply practicing scientific methodology when they question UFO-abduction cases and other paranormal claims.

Researcher Donna Bassett shares her experience as a pseudopatient in Mack's study.

William Cone, a clinical psychologist from Newport Beach, California, said he found a great deal of the research being conducted to be "atrociously bad" and echoed the charge made earlier by Robert Baker that poorly trained researchers often impose their beliefs on patients. The patients themselves, in Cone's experience, go public either to be paid by the media or to garner notoriety and attention from public appearances, or are simply looking for a sense of identity, wanting to belong somewhere. He said he has also diagnosed many of these people as mentally ill, paranoid, or delusional. Cone admitted he had found a subgroup of patients who do not fit his explanations, but he emphasized that "a remembrance of an event does not make the event so"—a point that would be reiterated throughout the conference.

On the recommendation of John Mack, Sharon Phillip, a hypnotherapist, spoke next. Since experiencing a UFO sighting as a teenager, Phillip said, she has had many UFO and alien encounters, once witnessing an alien materialize in a doorway. She maintains that what she encountered were not sleep-paralysis hallucinations, but conscious experiences, and urged the audience to keep an open mind in these matters.

To balance the proceedings, Donna Bassett, a researcher who had participated in John Mack's recent study, was then called up to speak. At first Bassett seemed to indicate she was one of Mack's "abductees." But she quickly announced that since September 1992 she had been only posing as one in order to infiltrate Mack's study and learn about his research methods. "I faked it," Bassett said, "women have been doing it for centuries." She reported that during her investigation she discovered that, despite Mack's good intentions, his procedures were flawed —he used little or no scientific methodology. She said that during therapy sessions with Mack, many patients would often practice "overlay," a term she said they invented to refer to their embellishing their stories. "They [the abductees] told John what he wanted to hear," Bassett added. She said she felt that many of the patients were seeking attention. Although she believed Mack's approach was wrong, she said that the subject nevertheless deserves study.

In response, Mack expressed his disappointment over what had just

occurred. "I am saddened by this. . . . I am a little bit clearer about it when I am told that she (Bassett) was found to play this role by Philip Klass—since that's his purpose, to destroy and undercut the credibility of this work." Although one audience member commented that not informing Mack prior to the conference that Bassett would be speaking was ethically questionable (even though her story had already been covered in *Time*'s April 25 investigative report about Mack), another said that the fact that Mack had not discovered Donna Bassett as a fake called into question his whole methodology. Mack replied: "I'm not yet convinced one way or the other—whether she did in fact hoax or whether she has in fact had these experiences herself. I don't know." After answering a few more questions (and restating the need for an "expanded epistemology"), Mack again implicated Klass in having a hand in Donna Bassett's work.

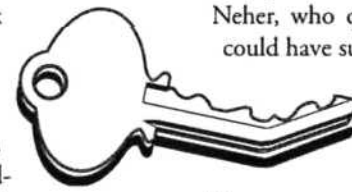
At this time, Klass had heard enough and angrily approached the stage. Taking the microphone, he chastised Mack for making what he labeled "false innuendoes." "Before you made accusations . . . why didn't you check with me? I could have told you that the first time I talked to Donna and her husband about you and your work was when they called me on January 9." After a few more exchanges, Paul Kurtz intervened and brought the session to a conclusion.

Ending the session on a humorous note, Robert Baker jokingly proposed that CSICOP's research should go in a new direction: "Sixty-nine percent of Americans believe in angels, and 32 percent claim they have had contact with them. Now that's a lot better than for alien abductions. I think we ought to investigate angels."

The Belief Engine: How World Views Are Formed

The session on perception and belief formation was introduced by moderator James Alcock, professor of psychology at Glendon College, York University. Alcock described sources of human perception and emphasized the ease with which our minds can make causal connections and patterns that may not exist. Our minds "take in information from the environment, combine it with aspects of memory, shape it to satisfy certain needs, and produce a belief that may or may not have anything to do with reality," Alcock said. Contributing to this framework of belief creation is what he called "magical thinking." As children, causal patterns are often incorrectly learned merely because one event is followed by another. Despite our expanding ability to operate with a critical perspective as we grow, fallacious beliefs that are functional and that, for example, aid our emotional survivability, can be sustained with this magical thinking, which Alcock said never completely leaves us. "We must always, to some degree, be suspicious of our own experience," he concluded. "We must never take it as the arbiter of truth."

"We must always, to some degree, be suspicious of our own experience. We must never take it as the arbiter of truth."



Ray Hyman, professor of psychology at the University of Oregon, reinforced Alcock's comments with a demonstration that left many suspicious of their own experience. Hyman summoned two volunteers from the audience. He asked each to select a key and to bend it using only a stroking movement and a strong will. After a few minutes with no results from his volunteers, Hyman was seemingly able to bend a key with only the power of his mind, an accomplishment he said was due to the "Geller effect." As a professor teaching classes in critical thinking, Hyman said he performs this trick for students to illustrate the undependable nature of eyewitness testimony. After producing a bent key, his students attempt to recall, in writing, what occurred during the demonstration, as well as to provide a possible theory to explain how the effect was achieved. What Hyman has consistently found over the years is that students will not report on the most crucial aspects of the trick simply because they do not know what to look for. In proposing theories, most offer natural explanations, such as switched keys, special key knowledge, or even enhanced finger strength. However, about one-quarter of his students contend that an authentic paranormal event has occurred. And only one student has ever correctly described Hyman's method.

Andrew Neher, professor of psychology at Cabrillo College, in Aptos, California, surveyed the audience to measure the degree of belief and disbelief in the paranormal. In his three-question poll, Neher found that most in the audience did not believe in paranormal events, are confident of their position, and are comfortable believing that paranormal events do not exist. Neher, who questioned how so many could have such a high degree of comfort in their stated positions, was answered by one audience member: "I am no more uncomfortable with a disbelief or the assumption that God does not exist, than I am with Bigfoot, the Loch Ness Monster, or the tooth fairy. I don't find anything more interesting or more valid from one to the other."

In discussing various motives for belief formation, Neher asserted that believers and skeptics often construct their views in similar ways. Each learns from families, friends, different organizations, and the society at large, and each tends to stereotype the other—

sometimes members of their own group. Neher cautioned skeptics not to allow their biases and dispositions to prevent the scientific study of certain beliefs. "Science can direct its energies to determining what is helpful to believe, without necessarily only researching whether the belief is veridical." Neher said that many who tend to reject science as elitist, irrelevant, or closed-minded have not been introduced to it as a process we all perform daily. "Science is not just something that scientists do somewhere else. All of us are scientists."

Anthony Pratkanis, professor of psychology at the University of California at Santa Cruz, spoke on "How to Sell a Pseudoscience." He delineated methods of persuasion many use to promote and sell deceptive "products." Subtly increasing steps of commitment, creating "credible" sources and leaders to end doubt, and establishing "granfalloons" ("in the know" groups of shared social identities) are but a few of the persuasive tactics used to gain a target's trust. These methods often incorporate widely accepted, commonplace "truths" that can be used to embellish concepts or issues to create the desired submissive effect, Pratkanis said. And—as he himself experienced after publishing negative findings in subliminal-tape studies—to dispense with troublesome opponents to your cause, innuendo and character assassination are frequently used. Pratkanis called for careful understanding of these persuasion tactics.

An Illustrated History of UFOs

James McGaha, a retired Air Force pilot and an amateur astronomer, treated the audience to an interesting and often humorous history of UFOs. In an hour-long illustrated talk, McGaha chronicled the alleged UFO encounters, media influences, and government-conspiracy beliefs dating from the 1896 airship incidents up to the sinister abduction claims of the 1990s. He showed a wide range of bizarre UFO shapes and alien forms, explaining that "UFOs parallel popular culture, particularly science-fiction movies, books, magazines, and television shows." McGaha demonstrated that just before each of the waves of UFO-sightings over the years, popular UFO stories were often prevalent in the entertainment media. In contrast to the view held by Thomas Bullard, a speaker on the previous evening, McGaha asserted that the evolution of alien images into a creature with a small body and a large, bulbous head is indeed a result of Steven Spielberg's *Close Encounters of the Third Kind*. McGaha also referred to numerous alien encounters and supposed government cover-ups, including the 1947 Kenneth Arnold sighting, that he believes were simply mountaintop mirages, and the Roswell incident, in which a clerical error set in motion the amazing tales of an alien spacecraft and government secrets. The accusations that government agencies are concealing aliens and their vehicles as well as the belief that Air Force pilots are trained as UFO observers, he also dispelled as unfounded.

McGaha said we should not abandon our reasoning ability and scientific understanding of nature, despite the ever-increasing range of UFO beliefs in American culture. "Where is the evidence? There is no empirical evidence that UFOs have ever visited the planet, none—UFOlogy is clearly a belief system."

Coverage of the 1994 CSICOP Conference will continue in the next issue.

Session I. ALIEN ABDUCTIONS. Paul Kurtz, Robert Baker, Thomas Bullard, John Mack. $13.90 $ ____

Session II. THE BELIEF ENGINE: HOW WORLDVIEWS ARE FORMED. James Alcock, Ray Hyman, Andrew Neher, Anthony Pratkanis. $13.90 $ ____

Session III. Luncheon. AN ILLUSTRATED HISTORY OF UFOS. James McGaha. $6.95 $ ____

Session IV. HOW WE FOOL OURSELVES: ANOMALIES OF PERCEPTION AND INTERPRETATION. Barry Beyerstein Susan Blackmore, Elizabeth Loftus, Jerry Andrus. $13.90 $ ____

Session V. KEYNOTE ADDRESS. Carl Sagan. $13.90 $ ____

Session VI. MEMORY: HOW RELIABLE IS IT? Carol Tarvis, Stephen Ceci, Richard Ofshe, Loren Pankratz. $13.90 $ ____

Session VII. CSICOP Luncheon. CSICOP AND THE LAW. Brendon VerPloeg. Remarks by Kendrick Frazier and Joe Nickell, for the CSICOP Executive Council. $6.95 $ ____

Session VIII. INFLUENCING BELIEFS IN THE COURTROOM. Gerald M. Rosen, Barry Beyerstein, Peter Huber, Timothy Moore. $13.90 $ ____

Session IX. AWARDS BANQUET. Paul Kurtz, Carl Sagan, John Maddox, Elizabeth Loftus, and others. $13.90 $ ____

Session X. CONSPIRACY THEORIES. Lee Nisbet, Don Kates, Philip J. Klass, Valerie Klein. $13.90 $ ____

Complete set of conference tapes $118.14 (no charge for p&h) $ ____

Total $ ____

Audio tapes of the

CSICOP Conference in Seattle, June 23-26, 1994

Order the complete conference now for $118.14

Charge my ☐Visa ☐Master Card ☐Check enclosed
(please pay in U.S funds drawn on a U.S. bank)

#_____

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

SKEPTICAL INQUIRER • Box 703 • Amherst, NY 14226-0703
Order toll free: 1-800-634-1610

Literary Science Blunders

MARTIN GARDNER

C. P. Snow, in his famous little book *The Two Cultures*, maintained that scientists usually know more about the arts than leaders of the humanities know about science. One could fill this page with the names of great scientists and mathematicians—Einstein is a notable example—who loved classical music, many of whom were even skilled in playing it. Other scientists, eminent and not so eminent, have been unusually knowledgeable about poetry, literature, painting, and philosophy.

Contrariwise, it is not easy to find musicians, painters, novelists, poets, and especially actors, who have a knowledge of science beyond what they learned in grade school. There are, of course, exceptions. Snow himself was a novelist who bridged the two cultures. H. G. Wells was an earlier example. Milton and Dante were well acquainted with the science of their time. So was Shelley. The same can be said of such modern writers as Nabokov, Borges, Auden, Pynchon, Vonnegut, and Updike. By and large, however, persons trained in the arts tend to be appallingly ignorant of the most elementary science. I recall a confusing conversation I once had with a graduate student in English literature before I realized he did not know, as Shakespeare did, that what the bard called the moon's "pale fire" was "snatched" from the sun.

Over the decades I have gathered a list of amusing howlers involving science that occur in literary works. Because it is far from exhaustive I would welcome hearing of any blunders I have missed. It goes without saying that a science mistake in a work of fiction is only a minor blemish that in no way mars the literary value of the work.

Let's start with a little-noticed mistake by F. Scott Fitzgerald in his masterpiece, *The Great Gatsby*. In Chapter 2, Fitzgerald describes a huge sign in front of an oculist's shop in Queens, New York: "The eyes of Doctor T. J. Eckleburg are blue and gigantic—their retinas are one yard high. They look out of no face but, instead, from a pair of enormous yellow spectacles which pass over a nonexistent nose." Throughout the novel the giant eyes symbolize the eyes of God. Did you get the mistake? One cannot see retinas. Fitzgerald meant pupils or irises.

The first edition of Willa Cather's best-known novel, *Death Comes for the Archbishop*, had the following incredible passage:

> . . . A chasm in the earth over two hundred feet deep . . . through the sunken fields and pastures, flowed a rushing stream which came from the high mountains. Its original source was so high, indeed, that by merely laying an open wooden trough up the opposite side of the arroyo, the Mexicans conveyed the water to the plateau at the top. This sluice was laid in sections that zigzagged up the face of the cliff.

Water can flow upward only when confined within siphons and other structures, but not in open troughs. The error was corrected in later editions. In the same edition Cather speaks of mesas in the region of Acoma, New Mexico, as "great tables of granite." Actually they are made of sandstone. Another passage refers to a man's right eye as "overgrown by a cataract." Cataracts are not growths on the outside of an eye lens, as many believe. They are a clouding of the lens itself.

William Golding's novel *Lord of the Flies* contains two outstanding howlers. Here is how Ralph, in the second chapter, starts a fire by using the spectacles of the myopic Piggy:

> There was pushing and pulling and officious cries. Ralph moved the lenses back and forth, this way and that, till a glossy white image of the declining sun lay on a piece of rotten

wood. Almost at once a thin trickle of smoke rose up and made him cough. Jack knelt too and blew gently, *so that the smoke drifted away,* thickening, and a tiny flame appeared. The flame, nearly invisible at first in that bright sunlight, enveloped a small twig, grew, was enriched with color and reached up to a branch which exploded with a sharp crack. The flame flapped higher and the boys broke into a cheer.

Nearsighted (myopic) persons wear lenses that are concave. Only convex lenses can focus sunlight on a small spot.

James Hugh, in "You Can Be Myopic and Still Survive on a Desert Island," in the *Physics Teacher* (December 1991), pointed out that a lens for correcting nearsightedness is actually convex on the outward side, but strongly concave on the side facing the eye. If such a lens is held horizontally, the concavity can be filled with water to make it a convex lens capable of starting a fire.

Golding makes an even worse mistake in Chapter 5. The sun has just set, stars have appeared, and a "sliver of moon" is rising above the horizon. Golding, who majored in science at Oxford before he switched to literature, should have known that a moon rising after sunset has to be full, not crescent shaped.

Mistakes about the moon are common in both fiction and poetry. Evidently most people are not aware that the moon, like the sun and the stars, rises in the east and sets in the west. They seem to think the moon floats about the sky randomly until it is dark enough to become visible.

Coleridge makes the same mistake in *The Ancient Mariner.* In Part 3 "The Sun's rim dips, the stars rush out: At one stride comes the dark." This is followed by a "horned moon" climbing in the east. Not only is this moon a crescent, but it has "one bright star within its nether tip." The line originally read "almost atween the tips," so Coleridge may have known that a star inside the moon's crescent is impossible, and intended this to be a supernatural omen.

In George Eliot's *Mill on the Floss,* Maggie Tulliver and her brother are drowned on the river Floss when their frail boat is overturned by a mass of debris floating toward them at a faster rate than the boat is drifting. Actually, both boat and debris, unless there were strong eddies or countercurrents, would move through the flowing river at the same rate.

An illustration from the first edition of Jules Verne's *From the Earth to the Moon.* Although in free fall, neither the man, dog, nor anchor are floating in weightlessness.

In spite of lurid books and articles to the contrary, by poorly informed journalists of pseudoscience, chemists agree that no human being ever caught fire by spontaneous combustion. Such events occur only in fiction, the most notorious instance being the sudden combustion of a drunken Mr. Krock in Dickens's *Bleak House.* Other instances of such deaths can be found in Charles Brockton Brown's *Wieland,* Nicolai Gogol's *Dead Souls,* Frederick Marryat's *Jacob Faithful,* Herman Melville's *Redburn,* and Emile Zola's *Le Docteur Pascal.*

The first edition (1885) of H. Rider Haggard's best-selling novel *King Solomon's Mines,* in Chapter 11, "We Give a Sign," has a total eclipse of the sun taking place during a full moon, and producing total darkness for an hour and a half. A total eclipse of the sun can occur only when the moon is between the earth and the sun and thus invisible, and totality lasts only a few minutes. Not until the edition of 1886 did Haggard change the event to a lunar eclipse.

It is easy to forget that the moon, like stars, can be overhead in the daytime but nearly invisible. If the moon is full or gibbous, it often shines in the dim light of sunrise or sunset. Apparently T. S. Eliot forgot this when he complained about the seeming obscurity of the fifth stanza of Shelley's "To a Skylark":

> Keen as are the arrows
> Of that silver sphere,
> Whose intense lamp narrows
> In the white dawn clear
> Until we hardly see—we feel that it
> is there.

Is not the meaning obvious? Shelley is describing a silvery full moon at daybreak. As the sky gets brighter, the image slowly fades until it reaches a point when you hardly see it but "feel"

Among Martin Gardner's most recent books are Fractal Music, Hypercards and More *(W. H. Freeman) and* The Healing Revelations of Mary Baker Eddy *(Prometheus Books).*

An alien male creature lusts after a human female in an illustration for a story in 1976 by Carolos Maria Federica, a Uruguayan science-fiction author. (From *Science Fiction: An Illustrated History*, by Sam Lundwall, Grosset and Dunlap, 1978.)

it is still there. The vanishing is especially rapid in the foggy, air-polluted skies of London. In a similar way, the song of a retreating skylark trails off into silence.

It is hard to believe, but here is what Eliot had to say about this stanza in "A Note on Richard Crashaw" in his book *For Lancelot Andrews*:

> For the first time perhaps in a verse of such eminence, sound exists without sense. . . . I should be grateful for any explanation of this stanza; until now I am still ignorant to what sphere Shelley refers, or why it should have silver arrows, or what the devil he means by an intense lamp narrowing in the white dawn; though I can understand that we could hardly see the lamp of a silver sphere narrowing in white dawn (why dawn? as he has just referred to the pale purple even). There may be some clue for persons more learned than I; but Shelley should have provided notes.

Someone must have explained the stanza to Eliot because he removed his objection when the essay was reprinted in a later book.

A common but mistaken belief is that the plane on which a Foucault pendulum swings does not rotate relative to the stars. Umberto Eco, on the second page of his novel *Foucault's Pendulum*, states that the pendulum's plane never changes direction. This is true only if the pendulum swings at the north or south pole.

Thomas Cook, in his crime novel *Flesh and Blood* (1989), has on page 44 an autopsy report saying, "At the moment of her death, her heart had weighed four grams, her brain seven." He must have meant kilograms.

Edgar Rice Burroughs, who never set foot in Africa, made so many booboos about Africa's flora and fauna in his Tarzan series that I understand residents of the dark continent read the Tarzan books partly for laughs.

Science-fiction writers are, of course, free to indulge in wild fantasy about traveling faster than light, taking shortcuts through space warps, or going back in time in spite of the logical paradoxes that arise, such as how you could exist if you murdered your father when he was a child. The whole range of psi phenomena (ESP, PK, precognition, and so on) pervades much of science fiction, as do aliens in UFOs visiting earth, the transmission of human bodies by dissolving and reconstituting their molecules ("Beam me up, Scotty"), and a thousand other improbable things.

Of course we can forgive science-fiction writers for introducing Martian canals before it was clear they did not exist, or describing the "twilight zone" on Mercury. H. G. Wells correctly anticipated the dropping of "atom bombs" in World War II, in his most prophetic novel *The World Set Free*, but his airplanes were so primitive that the bombs were released by hand through a hole in the bottom of the plane. Although electrical computers appear in early science fiction, almost no author anticipated the computer revolution. There are stories taking place far in the future with scientists still making calculations on slide rules! Arthur Clarke, in his novel *Master of Space*, was the only writer to anticipate the televising on earth of the first moon landing.

Now and then, however, even the best science-fiction writers nod and make unintended blunders. Jules Verne's *From the Earth to the Moon* is a classic instance. Inertial forces produced by the cannon used to shoot a spaceship to the moon would have killed the astronauts. Verne assumes that on the trip earth's gravity would slowly diminish while the moon's gravity would slowly increase until the ship reached a balance point where the two gravity pulls would be equal. Only then would the astronauts float freely

about inside their ship. Verne should have known that his ship would be in free-fall all the way to the moon, with weightlessness experienced inside at all times. Another blunder occurs when the travelers fling out a dead dog and the carcass floats alongside the ship instead of speeding off horizontally.

H. G. Wells trounced Verne for such blunders, but in his *First Men in the Moon* he makes a mistake equally absurd. We cannot fault him for his Cavorite, a substance that insulates the ship from gravity, because Einstein had not yet shown that any sort of gravity shield would be impossible.

Wells describes all the unattached objects in his spaceship as clustering toward the sphere's center by the attraction of their masses. Of course their gravitational pulls would be far too minute to have such an effect.

It is well known that inside a spherical shell, no matter how large, gravitational attraction due to the sphere itself is zero at all points. Ross Rocklynne, in his story "At the Center of Gravity," has men trapped by gravity at the center of a hollow sphere the size of the earth.

Just as many mistakes about space travel turn up in science-fiction films. One of the most common errors is showing a ship moving relative to the stars. Stars are much too far away and too far apart to display such motion.

Electronic conversations back and forth over vast distances, with no recognition of time delays, frequently take place in science-fiction stories and movies. Laser beams often glow as they move through space when in fact they would be invisible in the absence of molecules.

Another frequent blunder of early science fiction was assuming that meteor or meteoroid collisions with spaceships would be a constant hazard. Actually, encounters with meteors, even with asteroids while moving through the asteroid belt, would be rare because of the vast distances between them. Hollow earths play a role in fiction by Verne, Burroughs, Poe, and others. Inertial drives for spaceships violate Newton's third law of motion (conservation of momentum) yet they are featured in many science-fiction yarns. Even Arthur Clarke, who knows better, uses an inertial drive in *Rendezvous with Rama.* For several years John Campbell, the editor of *Analog Science Fiction,* who tumbled for a variety of pseudosciences (including Scientology), trumpeted a worthless space drive in his magazine.

Charles Eric Maine, in *High Vacuum,* speaks of astronauts in space suits on an airless planet as being unable to hear their own footsteps. He should have realized that footstep sounds would be transmitted by shoes, feet, legs, and air inside the suits. In *The Tomorrow People,* Judith Meril has a helicopter whirling about the moon, where the absence of atmosphere, as even Kant observed, would prevent birds from flying. In *Hothouse,* Brian Aldiss has giant spiders spinning webs that join the earth and the moon, forgetting that the earth's rotation relative to the moon would rip such webs apart.

It is conceivable that humanoids from other planets might find humans sexually attractive, but early science fiction often had bug-eyed monster males making passes at female earthlings, something akin to an earthling being sexually aroused by an octopus.

Lord Byron's Prisoner of Chillon says:

> My hair is grey, but not with years,
> Nor grew it white in a single night
> As men's have grown from sudden fears.

Hair cannot suddenly turn white, although it does so in many nineteenth-century novels.

How often have you encountered in fiction and films persons who disguised their voices on the telephone by stretching a handkerchief over the mouthpiece, or who listen to conversation in another room by putting an ear to the bottom of a drinking glass, its rim pressing against the wall? Cloth has no effect on the quality of a voice. When eavesdropping on sounds in another room, you do even better by flattening an ear to the wall. As a child, I recall being puzzled by one of Harold Lloyd's comedies in which someone chalked "KICK" on a wall. When Harold leaned against the wall the words, unreversed, were imprinted on the back of his jacket.

I myself once wrote a story called "The Island of Five Colors," based on my confusing the famous four-color-map theorem (unproved at the time) with a completely different theorem, easily verified by graph theory, that five regions cannot be drawn on the plane so each borders the other four. The two theorems are often thought to be the same, as I learned to my embarrassment after the story appeared in an anthology.

I find in my files the following charming poem by Mary Winter, clipped from the *New York Times* (December 4, 1957):

THE STRANGER TRUTH

> Forming a bivalve, as before,
> The shell close-cupped upon my ear
> Gives back the waves' diminished
> roar.
>
> A child's faith once implicitly
> Accepted this fine fantasy.
> As clear, oh clear, the surge and
> whirr
> Of surf and wind came back to
> her.
>
> And magic still returns, though
> sense
> Instructs my muted turbulence;
> Rhythm of blood's salt tide in me
> Murmurs the cadence of the sea.
> Wonder revives, though knowing
> well,
> My ear, it is, informs the shell.

The poem's theme is that the roaring you hear in shells is not an echo of ocean waves but something even stranger—the echo of blood coursing through the veins of your head. The truth is less strange. It is merely the echo of sounds in the air around you as their waves resonate inside the shell's chamber. □

The Dark Side of Linus Pauling's Legacy

STEPHEN BARRETT

Linus Pauling was the only person ever to win two unshared Nobel prizes. He received these awards for Chemistry in 1954 and for Peace in 1962. His recent death has stimulated many tributes to his scientific accomplishments. He has been called by many colleagues the greatest chemist of the twentieth century. That was for his fundamental contributions to chemistry. His impact on the health marketplace, however, was anything but laudable.

Pauling is largely responsible for the widespread misbelief that high doses of vitamin C are effective against colds and other illnesses. In 1968, he postulated that people's needs for vitamins and other nutrients vary markedly and that to maintain good health many people need amounts of nutrients much greater than the Recommended Dietary Allowances (RDAs). And he speculated that megadoses of certain vitamins and minerals might well be the treatment of choice for some forms of mental illness. He termed his approach "orthomolecular," meaning "right molecule." After that, he steadily expanded the list of illnesses he believed could be influenced by "orthomolecular" therapy and the number of nutrients suitable for such use. No responsible medical or nutrition scientists share these views.

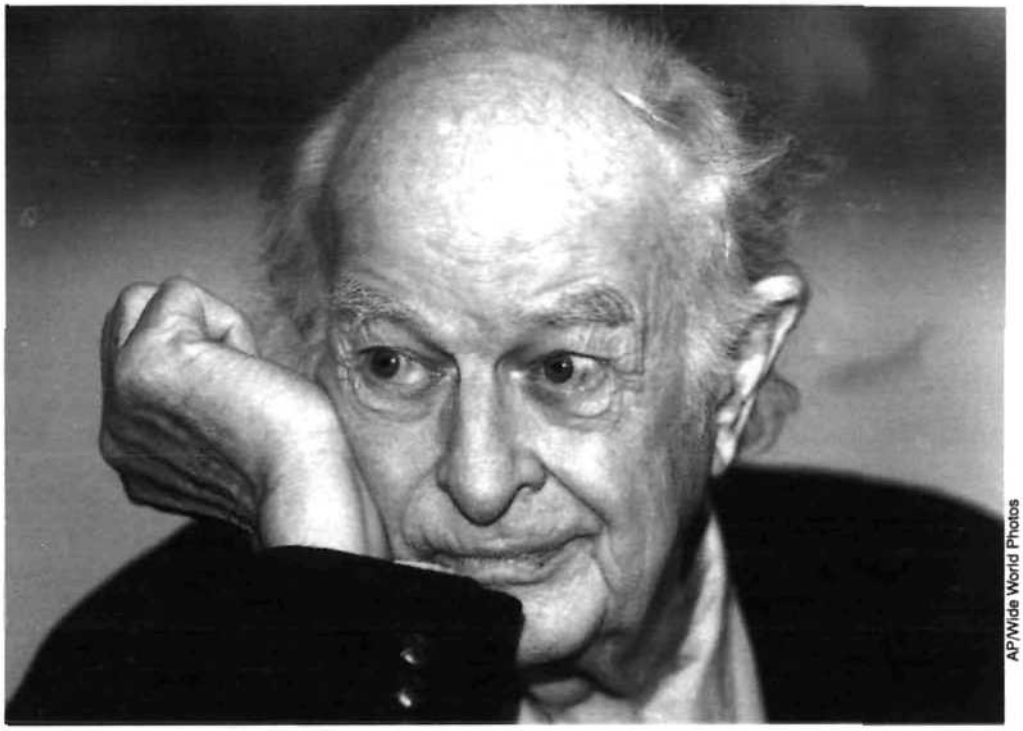
In 1970 Pauling announced in *Vitamin C and the Common Cold* that taking 1,000 milligrams (mg) of vitamin C daily will reduce the incidence of colds by 45 percent for most people but that some people need much larger amounts. (The RDA for vitamin C is 60 mg.) The 1976 revision of the book, retitled *Vitamin C, the Common Cold and the Flu*, suggested even higher dosages. A third book, *Vitamin C and Cancer* (1979), claims that high doses of vitamin C may be effective against cancer. Yet another book, *How to Feel Better and Live Longer* (1986), stated that megadoses of vitamins "can improve your health . . . to increase your enjoyment of life and can help in controlling heart disease, cancer, and other diseases and in slowing down the process of aging." Pauling himself reportedly took at least 12,000 mg daily and raised the amount to 40,000 mg if symptoms of a cold appeared. In 1993, after undergoing radiation therapy for prostate cancer, Pauling said that vitamin C had delayed the cancer's onset for 20 years. This is not a testable claim. He died of the disease in August 1994 at the age of 93.

Scientific fact is established when the same experiment is carried out over and over again with the same results. To test the effect of vitamin C on colds, it is necessary to compare groups that get the vitamin with similar groups that get a placebo (a dummy pill that looks like the real thing). Since the common cold is a very variable illness, proper tests must involve hundreds of people for significantly long periods of time. At least 16 well-designed, double-blind studies have shown that supplementation with vitamin C does not prevent colds and at best may slightly reduce the symptoms of a cold. Slight symptom reduction may occur as the result of an antihistamine-like effect, but whether this has practical value is a matter of dispute. Pauling's views are based on the same studies considered by other scientists, but his analyses are flawed.

The largest clinical trials, involving thousands of volunteers, were directed by Terence Anderson, professor of epidemiology at the University of Toronto. Taken together, his studies suggest that extra vitamin C may slightly reduce the severity of colds, but it is not necessary to take the high doses suggested by Pauling to achieve this result. Nor is there anything to be gained by taking vitamin C supplements year-round in the hope of preventing colds.

Another important study was reported in 1975 by scientists at the National Institutes of Health who compared vitamin C pills with a placebo before and during colds. Although

the experiment was supposed to be double-blind, half the subjects were able to guess which pill they were getting. When the results were tabulated with all subjects lumped together, the vitamin group reported fewer colds per person over a nine-month period. But among the half who hadn't guessed which pill they had been taking, no difference in the incidence or severity was found. This illustrates how people who think they are doing something effective (such as taking a vitamin) can report a favorable result even when none exists.



AP/Wide World Photos

Two-time Nobel laureate Linus Pauling fields questions asked at a 1991 press conference in San Francisco.

In 1976, Pauling and Ewan Cameron, a Scottish physician, reported that a majority of one hundred "terminal" cancer patients treated with 10,000 mg of vitamin C daily survived three to four times longer than similar patients who did not receive vitamin C supplements. However, William DeWys, chief of clinical investigations at the National Cancer Institute, found that the study was poorly designed, because the patient groups were not comparable. The vitamin C patients were Cameron's while the other patients were under the care of other physicians. Cameron's patients were started on vitamin C when he labeled them "untreatable" by other methods, and their subsequent survival was compared with the survival of the "control" patients after they were labeled untreatable by their doctors. DeWys reasoned that if the two groups were comparable, the lengths of time from entry into the hospital to being labeled untreatable should be equivalent in both groups. However, he found that Cameron's patients were labeled untreatable much earlier in the course of their disease—which means that they entered the hospital before they were as sick as the other doctors' patients and would naturally be expected to live longer.

Nevertheless, to test whether Pauling might be correct, the Mayo Clinic conducted three double-blind studies involving a total of 367 patients with advanced cancer. The studies, reported in 1979, 1983, and 1985, found that patients given 10,000 mg of vitamin C daily did no better than those given a placebo. Pauling criticized the first study, claiming that chemotherapeutic agents might have suppressed the patients' immune systems so that vitamin C couldn't work. But his 1976 report on Cameron's work states clearly that: "All patients are treated initially in a perfectly conventional way, by operation, use of radiotherapy, and the administration of hormones and cytotoxic substances." And during a subsequent talk at the University of Arizona, he stated that vitamin C therapy could be used along with all conventional modalities. The participants in the 1983 study had not undergone conventional treatment, but Pauling dismissed its results anyway.

Science aside, it is clear that Pauling was politically aligned with the promoters of unscientific nutrition practices. He said his initial interest in vitamin C was aroused by a letter from biochemist Irwin Stone, with whom he subsequently maintained a close working relationship. Although Stone was often referred to as "Dr. Stone," his only credentials were a certificate showing completion of a two-year chemistry program, an honorary chiropractic degree from the Los Angeles College of Chiropractic, and a "Ph.D." from Donsbach University, a nonaccredited correspondence school.

In a little-publicized chapter in *Vitamin C and the Common Cold,* Pauling attacked the health-food industry for misleading its customers. Pointing out that "synthetic" vitamin C is identical with "natural" vitamin C, he warned that higher-priced "natural" products are a "waste of money." And he added that "the words 'organically grown' are essentially meaningless—

Stephen Barrett, M.D., a retired psychiatrist and nationally known consumer advocate, is coauthor/editor of 36 books on health topics. His most recent work is The Vitamin Pushers: How the "Health Food" Industry Is Selling America a Bill of Goods.

just part of the jargon used by health-food promoters in making their excess profits, often from elderly people with low incomes." But *Vitamin C, the Common Cold and the Flu,* issued six years later, contained none of these criticisms. This omission was not accidental. In response to a letter, Pauling informed me that, after his first book came out, he was "strongly attacked by people who were also attacking the health-food people." He said that his critics were so "biased" that he would no longer help them attack the health-food industry while another part of their attack was directed at him.

"Pauling is largely responsible for the widespread misbelief that high doses of vitamin C are effective against colds and other illnesses."

The Linus Pauling Institute of Medicine, founded in 1973, is dedicated to "orthomolecular medicine." Many of the institute's fund-raising brochures have contained questionable information. They have falsely claimed, for example, that no significant progress has been made in cancer treatment in the past 20 years. This viewpoint, which is frequently expressed by promoters of unproved cancer therapies, is simply untrue. The institute's largest corporate donor has been Hoffmann-La Roche, the pharmaceutical giant that produces most of the world's vitamin C.

A dispute between Pauling and Arthur Robinson gives additional evidence that Pauling's defense of vitamin C megadosage was less than honest. Robinson, a former student and longtime associate of Pauling, helped found the institute and became its first president. According to an investigative report by James Lowell, in *Nutrition Forum* newsletter, Robinson's own research led him to conclude in 1978 that the high doses (5-10 grams a day) of vitamin C being recommended by Pauling might actually promote some types of cancer in mice. Robinson told Lowell, for example, that animals fed quantities equivalent to Pauling's recommendations contracted skin cancer almost twice as frequently as the control group and that only doses of vitamin C that were nearly lethal had any protective effect. Shortly after reporting this to Pauling, Robinson was asked to resign from the Institute, his experimental animals were killed, his scientific data were impounded, and some of the previous research results were destroyed. Pauling also declared publicly that Robinson's research was "amateurish" and inadequate. Robinson responded by suing the Institute and its trustees. In 1983, the suit was settled out of court for $575,000. In an interview quoted in *Nature,* Pauling said that the settlement "represented no more than compensation for loss of office and the cost of Robinson's legal fees." However, the court-approved agreement states that $425,000 of the settlement was for slander and libel.

During the mid-1970s, Pauling helped lead the health-food industry's campaign for a federal law that weakened FDA protection of consumers against misleading nutritional claims. In 1977 and 1979, Pauling received awards and presented his views on vitamin C at the annual conventions of the National Nutritional Foods Association (the major trade association of health-food retailers, distributors, and producers). In 1981, he accepted an award from the National Health Federation (NHF) for "services rendered in behalf of health freedom" and gave his daughter a life membership in this organization. NHF promotes the gamut of quackery. Many of its leaders have been in legal difficulty and some have even received prison sentences for various "health" activities. Pauling also spoke at a Parker School for Professional Success Seminar, a meeting where chiropractors were taught highly questionable methods of building their practices. An ad for the meeting invited chiropractors to pose with Pauling for a photograph (which presumably could be used for publicity when the chiropractors returned home).

In 1983, Pauling and Irwin Stone testified at a hearing on behalf of Oscar Falconi, a vitamin promoter charged by the Postal Service with making false claims for several products. Pauling supported Falconi's contentions that vitamin C was useful not only in preventing cancer, but also in curing drug addicts and destroying both viruses and bacteria. Pauling also testified in 1984 before the California Board of Medical Quality Assurance in defense of Michael Gerber, M.D., who was accused of improperly administering to patients. One was a 56-year-old woman with treatable cancer who—the Board concluded—had died as a result of Gerber's neglect while he treated her with herbs, enzymes, coffee enemas, and chelation therapy. The other patients were three-year-old twin boys with ear infections for which Gerber had prescribed 70,000 or more units of vitamin A daily and coffee enemas twice daily for several weeks. Gerber lost his license to practice medicine as a result of the hearings. In 1992, Pauling testified in behalf of "clinical ecologist" Warren M. Levin, during hearings that culminated in a recommendation by New York State authorities that Levin's license should be revoked for "gross negligence," "fraudulent practice," and "moral unfitness."

A flyer distributed in 1991 by the Linus Pauling Institute recommended daily doses of 6,000 to 18,000 mg of vitamin C, 400 to 1,600 IU of vitamin E, and 25,000 IU of vitamin A, plus various other vitamins and minerals. These dosages have no proved benefit and can cause troublesome side effects.

Although Pauling's megavitamin claims lacked the evidence needed for acceptance by the scientific community, they have been accepted by large numbers of people who lack the scientific expertise to evaluate them. Thanks largely to Pauling's prestige, annual vitamin C sales in the United States have been in the hundreds of millions of dollars for many years. The physical damage to people he led astray cannot be measured. □

The Non-amazing Kreskin Flubs Again

ROBERT SHEAFFER

The well-known mentalist "The Amazing Kreskin" has for many years been doing performances in which he appears to do astonishing feats of mind-reading, such as "predicting" future headlines and "mentally" locating hidden objects. This by itself is not terribly remarkable, since mentalism, the art of simulating extraordinary mental powers, is a well-established branch of magic, the art of impersonating the impossible. But when Kreskin spoke at the 1991 CSICOP Conference in Berkeley, California, some people angrily accused him of pretending to actually possess extraordinary powers. He disavowed making any such claims, and a big fracas ensued (SKEPTICAL INQUIRER, Fall 1991).

A recent mailing from the Amazing Kreskin reveals the type of mental power he now claims. A Mrs. Dorothy Lea of British Columbia received a mailing in which Kreskin said: "I come to you, Dorothy Lea. . . . I find myself drawn into your life today, June 29, 1994. I am going to use my power to put you in a world I believe you have never known. A world of big money. Exciting people. Happiness. Well-being. Is it possible for me to do all this? Yes, Dorothy Lea, I'm not called 'The Amazing Kreskin' for nothing."

He claims his work has been written up in international scientific journals as a supposed "parapsychology breakthrough." Kreskin also claims to be able to "get into a person's mind and awaken their SLEEPING PHENOMENOLOGICAL POWER." This, he explains, involves "a power that's being called a fourth dimensional force."

The bottom line is that Kreskin wants people to send in $20 (or $25 Canadian) for a "Client Power Certificate," which will unleash all these powers to work on your behalf for a "minimum 720-hour–maximum 744-hour Kreskin/client period for life enrichment."

Astonishingly, at the bottom of the letter Kreskin asks Mrs. Lea to fill in her date and year of birth. Why a man who can read minds and tell tomorrow's headlines would be unable to do something as simple as "know" a client's birthday is truly perplexing.

However, this mailing enables us to run a simple test of Kreskin's claimed powers. Mrs. Lea had been dead for two years at the time Kreskin says he felt himself "drawn into" her life. Somehow the fourth-dimensional force failed to inform him of that.

• • •

The recent collision between the various fragments of Comet Shoemaker-Levy 9 and Jupiter (Jupiter won) has, as you might expect, not been without interest to seers and the like. For example, a Polish-born seer calling herself

Kreskin continued on page 61

Top-Secret Balloon Project Looms Over TV Movie on Roswell Incident

C. EUGENE EMERY, JR.

At the conclusion of *Roswell,* the made-for-cable-television movie about the alleged crash of an extraterrestrial spacecraft in New Mexico in 1947, an enigmatic UFO investigator named Townsend confronts Major Jesse Marcel, who helped recover the debris and is trying to expose the U.S. government's efforts to hide the truth.

"You have nothing, just a lot of old memories and secondhand recollections," Townsend scolds Marcel, who is battered by years of ridicule for identifying the debris as extraterrestrial when the government insisted that the material was from a weather balloon. "Nobody is going to take you seriously, not without proof, not without hard evidence."

Kelvin Jones

Rancher Mac Brazel (played by Dwight Yoakam) found strange debris on his farm.

Somebody should have made that speech to Showtime, the cable outfit that bankrolled the movie, and its executive producer, Paul Davids, who says he saw a UFO in 1987. Perhaps they would have thought twice about creating this strange film, which premiered July 31 and promised "startling new information about an historic UFO incident."

There was nothing new here.

Roswell (the incident) has been short on facts and long on both speculation and secondhand memories since its origins in 1947.

Roswell (the movie) seems contrived to gloss over facts that contradict a UFO explanation and convince doubters that an alien spacecraft did indeed crash in a remote field. The film shows alien hieroglyphics, metal that can't be broken, and foil that de-wrinkles after it is folded.

But *Roswell* doesn't stop there. By the end of the film, viewers are told that four extraterrestrials were recovered near the crash site and that one of them lived long enough to send a telepathic message to U.S. Secretary of War James Forrestal.

Look closely and you can see that *Roswell*—like the alleged disinformation campaign that supposedly kept the UFO crash secret—is carefully calculated to neutralize the criticisms of the skeptics.

Do the critics carp that only a small amount of debris was recovered? The solution for the filmmakers is to show a huge area littered with truckloads of shiny, silvery alien stuff.

Do the critics insist that the recovered material came from the weather balloon? Then show a weather balloon being launched from the center of town and have the characters insisting that it couldn't have been a weather balloon because everyone knows what a weather balloon looks like.

Some of the holes in *Roswell* seem large enough to fly a Mother Ship through.

The local undertaker says he was called by someone at the military base looking for child-sized caskets and information on how to preserve bodies. Hadn't anyone on the base ever heard of refrigeration? Wasn't anyone on the base smart enough to bag the bodies and put them on ice?

Drop a dead alien on my doorstep and I'll want the autopsy done at a top-notch medical facility. But in *Roswell,* the autopsy is performed at the base, in a room crammed with (by my count) 28 people, 16 of whom weren't even wearing masks to guard against infection by an extraterrestrial virus or bacterium.

During the autopsy, one of the doc-

tors announces that the creature has no digestive system. Perhaps the ETs are solar powered.

And in the scene where the surviving alien telepathically communicates with Forrestal, the creature is shown lying on black sheets (how many hospitals have *those?*) and his attendants are, once again, wearing no masks to protect either themselves or the alien from illnesses to which they might have no immunity.

• • •

Coincidentally, the movie came out just as new evidence was surfacing that provided a convincing explanation for why the U.S. government has been cagey about the Roswell case.

The debris found at the ranch of Mac Brazel has been identified as a six-sided balloon-borne radar reflector launched as part of a secret military effort code named Project Mogul. The "hieroglyphics" reportedly found on the debris were apparently printed on patterned seamstress tape used in making the World War II-era radar reflectors.

Credit for finding the connection to Project Mogul goes to Robert G. Todd of Ardmore, Pennsylvania, whose Freedom of Information Act request produced the now-declassified documents about the project. Project Mogul consisted of a series of experiments to use high-altitude balloons to carry instruments aloft in an attempt to detect acoustic signatures perhaps propagated along the boundary between the troposphere and stratosphere from Soviet nuclear tests. The radar reflectors let the military keep track of the balloons. Another UFO researcher, Karl Pflock has also documented the link.

In September, the Air Force issued a report of its own investigation into the Roswell case, confirming, and providing more details about, Project Mogul. It even identified the debris as that of a specific, never-found Project Mogul balloon flight package launched in June 1947. (See "For the Record," p. 41 in this issue.)

Project Mogul scientist Charles B. Moore, now at the New Mexico Institute of Mining and Technology, but then of New York University, did not realize the connection until Todd gave him a copy of Brazel's original description of the debris, published in the July 9, 1947 *Roswell Daily Record.* The paper said "the tinfoil, paper, tape and sticks made a bundle about three feet long and seven or eight inches thick" and rubber strips "made a bundle about 18 or 20 inches long and about 8 inches thick. In all, [Brazel] estimated, the entire lot would have weighed maybe five pounds."

Kelvin Jones

Maj. Jesse A. Marcel (played by Kyle MacLachlan) investigates wreckage on the Brazel ranch.

Todd said Moore "immediately saw the significance of it because nobody had shown him the text (of the original description) before. It was obvious what it was."

The description in the *Roswell Daily Record* noted that "considerable scotch tape and some tape with flowers printed on it had been used in the construction." Moore suggested that the reflectors may have contained patterned tape because such reflectors were sometimes made in garment lofts in Manhattan.

• • •

Powerful documentaries often conclude with an epilogue designed to clinch the argument a filmmaker is trying to make. *Roswell* ends with several assertions that sound compelling only until you think about them:

• Since Marcel died in 1986, "over 350 witnesses to the event have agreed to talk." But even if you believe the movie version of the facts, too many of those witnesses were never in a position to have firsthand knowledge of the alleged events. The town undertaker never saw the bodies; he simply claims to know someone who did. Nobody saw the bodies of the aliens as they were being moved around, although they know somebody who might have. The radio newsman Frank Joyce is shown describing a government interrogation of Brazel that Brazel never acknowledges and that Joyce never witnessed.

• "Officially, the military denies that UFOs are extraterrestrial," which suggests that because the government officially denies it, it must be true. But just because the U.S. government might officially deny the existence of the tooth fairy doesn't automatically mean an ill-mannered dwarf is stalking our children and stealing their newly lost teeth.

• "The U.S. government has canceled its project to search for signs of extraterrestrial intelligence." I guess this is supposed to imply they canceled the search because they found something. That's news to Carl Sagan and others who are actively involved in the search. The fact is, a budget-conscious Congress cut off money for the search, which continues privately.

• "One in ten Americans claims to have seen a UFO." Guess that means Showtime's next documentary will show us the secret life of Santa Claus.

Another epilogue would have been more accurate: "Although 350 claim to be witnesses to the events described here, despite truckloads of debris with extraordinary physical characteristics, despite the windfall of four (count 'em, *four*) alien bodies available for examination, no reputable scientist has come forward to share some of the wealth of scientific knowledge such remains would undoubtedly produce. Nor is there any evidence that such knowledge has done anything to fuel the breakthroughs in physics, chemistry, engineering, or biology that have occurred in the intervening 47 years." □

Gene Emery is the science writer for the Providence Journal, *75 Fountain St., Providence, RI 02902.*

Wonder and Skepticism

CARL SAGAN

Science requires an almost complete openness to all ideas. On the other hand, it requires the most rigorous and uncompromising skepticism.

I was a child in a time of hope. I grew up when the expectations for science were very high: in the thirties and forties. I went to college in the early fifties, got my Ph.D. in 1960. There was a sense of optimism about science and the future. I dreamt of being able to do science. I grew up in Brooklyn, New York, and I was a street kid. I came from a nice nuclear family, but I spent a lot of time in the streets, as kids did then. I knew every bush and hedge, streetlight and stoop and theater wall for playing Chinese handball. But there was one aspect of that environment that, for some reason, struck me as different, and that was the stars.

Even with an early bedtime in winter you could see the stars. What were they? They weren't like hedges or even streetlights; they were different. So I asked my friends what they were. They said, "They're lights in the sky, kid." I could tell they were lights in the sky, but that

wasn't an explanation. I mean, what were they? Little electric bulbs on long black wires, so you couldn't see what they were held up by? What were they?

Not only could nobody tell me, but nobody even had the sense that it was an interesting question. They looked at me funny. I asked my parents; I asked my parents' friends; I asked other adults. None of them knew.

My mother said to me, "Look, we've just got you a library card. Take it, get on the streetcar, go to the New Utrecht branch of the New York Public Library, get out a book and find the answer."

That seemed to me a fantastically clever idea. I made the journey. I asked the librarian for a book on stars. (I was very small; I can still remember looking up at her, and she was sitting down.) She was gone a few minutes, brought one back, and gave it to me. Eagerly I sat down and opened the pages. But it was about Jean Harlow and Clark Gable, I think, a terrible disappointment. And so I went back to her, explained (it wasn't easy for me to do) that that wasn't what I had in mind at all, that what I wanted was a book about real stars. She thought this was funny, which embarrassed me further. But anyway, she went and got another book, the right kind of book. I took it and opened it and slowly turned the pages, until I came to the answer.

It was in there. It was stunning. The answer was that the Sun was a star, except very far away. The stars were suns; if you were close to them, they would look just like our sun. I tried to imagine how far away from the Sun you'd have to be for it to be as dim as a star. Of course I didn't know the inverse square law of light propagation; I hadn't a ghost of a chance of figuring it out. But it was clear to me that you'd have to be very far away. Farther away, probably, than New Jersey. The dazzling idea of a universe vast beyond imagining swept over me. It has stayed with me ever since.

I sensed awe. And later on (it took me several years to find this), I realized that we were on a planet—a little, non-self-luminous world going around our star. And so all those other stars might have planets going around them. If planets, then life, intelligence, other Brooklyns—who knew? The diversity of those possible worlds struck me. They didn't have to be exactly like ours, I was sure of it.

It seemed the most exciting thing to study. I didn't realize that you could be a professional scientist; I had the idea that I'd have to be, I don't know, a salesman (my father said that was better than the manufacturing end of things), and do science on weekends and evenings. It wasn't until my sophomore year in high school that my biology teacher revealed to me that there was such a thing as a professional scientist, who got paid to do it; so you could spend all your time learning about the universe. It was a glorious day.

Moon Catcher by Leonard Parkin

Carl Sagan is David Duncan Professor of Astronomy and Space Science at Cornell University. His latest book is Pale Blue Dot: A Vision of the Human Future in Space *(Random House, 1994). This article is based on his Keynote Address to the 1994 CSICOP Conference.*

It's been my enormous good luck—I was born at just the right time—to have had, to some extent, those childhood ambitions satisfied. I've been involved in the exploration of the solar system, in the most amazing parallel to the science fiction of my childhood. We actually send spacecraft to other worlds. We fly by them; we orbit them; we land on them. We design and control the robots: Tell it to dig, and it digs. Tell it to determine the chemistry of a soil sample, and it determines the chemistry. For me the continuum from childhood wonder and early science fiction to professional reality has been almost seamless. It's never been, "Oh, gee, this is nothing like what I had imagined." Just the opposite: It's exactly like what I imagined. And so I feel enormously fortunate.

Science is still one of my chief joys. The popularization of science that Isaac Asimov did so well—the communication not just of the findings but of the methods of science—seems to me as natural as breathing. After all, when you're in love, you want to tell the world. The idea that scientists shouldn't talk about their science to the public seems to me bizarre.

There's another reason I think popularizing science is important, why I try to do it. It's a foreboding I have—maybe ill-placed—of an America in my children's generation, or my grandchildren's generation, when all the manufacturing industries have slipped away to other countries; when we're a service and information-processing economy; when awesome technological powers are in the hands of a very few, and no one representing the public interest even grasps the issues; when the people (by "the people" I mean the broad population in a democracy) have lost the ability to set their own agendas, or even to knowledgeably question those who do set the agendas; when there is no practice in questioning those in authority; when, clutching our crystals and religiously consulting our horoscopes, our critical faculties in steep decline, unable to distinguish between what's true and what feels good, we slide, almost without noticing, into superstition and darkness.

"To make sure that the powers of science and technology are used properly and prudently, we ourselves must understand science and technology."

CSICOP plays a sometimes lonely but still—and in this case the word may be right—heroic role in trying to counter some of those trends.

We have a civilization based on science and technology, and we've cleverly arranged things so that almost nobody understands science and technology. That is as clear a prescription for disaster as you can imagine. While we might get away with this combustible mixture of ignorance and power for a while, sooner or later it's going to blow up in our faces. The powers of modern technology are so formidable that it's insufficient just to say, "Well, those in charge, I'm sure, are doing a good job." This is a democracy, and for us to make sure that the powers of science and technology are used properly and prudently, we ourselves must understand science and technology. We must be involved in the decision-making process.

The predictive powers of some areas, at least, of science are phenomenal. They are the clearest counterargument I can imagine to those who say, "Oh, science is situational; science is just the current fashion; science is the promotion of the self-interests of those in power." Surely there is some of that. Surely if there's any powerful tool, those in power will try to use it, or even monopolize it. Surely scientists, being people, grow up in a society and reflect the prejudices of that society. How could it be otherwise? Some scientists have been nationalists; some have been racists; some have been sexists. But that doesn't undermine the validity of science. It's just a consequence of being human.

So, imagine—there are so many areas we could think of—imagine you want to know the sex of your unborn child. There are several approaches. You could, for example, do what the late film star who Annie and I admire greatly—Cary Grant—did before he was an actor: In a carnival or fair or consulting room, you suspend a watch or a plumb bob above the abdomen of the expectant mother; if it swings left-right it's a boy, and if it swings forward-back it's a girl. The method works one time in two. Of course he was out of there before the baby was born, so he never heard from customers who complained he got it wrong. Being right one chance in two—that's not so bad. It's better than, say, Kremlinologists used to do. But if you really want to know, then you go to amniocentesis, or to sonograms; and there your chance of being right is 99 out of 100. It's not perfect, but it's a whole lot better than one out of two. If you really want to know, you go to science.

Or suppose you wanted to know when the next eclipse of the sun is. Science does something really astonishing: It can tell you a century in advance where the eclipse is going to be on Earth and when, say, totality will be, to the second. Think of the predictive power this implies. Think of how much you must understand to be able to say when and where there's going to be an eclipse so far in the future.

Or (the same physics exactly) imagine launching a spacecraft from Earth, like the Voyager spacecraft in 1977; 12 years later Voyager 1 arrives at Neptune within 100 kilometers or something of where it was supposed to be—not having to use some of the mid-course corrections that were available; 12 years, 5 billion kilometers, on target!

So if you want to really be able to predict the future—not in everything, but in some areas—there's only one regime of human scholarship, of human claims to knowledge, that really delivers the goods, and that's science. Religions would give their eyeteeth to be able to predict anything like that

well. Think of how much mileage they would make if they ever could do predictions comparably unambiguous and *precise*.

Now how does it work? Why is it so successful?

Science has built-in error-correcting mechanisms—because science recognizes that scientists, like everybody else, are fallible, that we make mistakes, that we're driven by the same prejudices as everybody else. There are no forbidden questions. Arguments from authority are worthless. Claims must be demonstrated. Ad hominem arguments—arguments about the personality of somebody who disagrees with you—are irrelevant; they can be sleazeballs and be right, and you can be a pillar of the community and be wrong.

If you take a look at science in its everyday function, of course you find that scientists run the gamut of human emotions and personalities and character and so on. But there's one thing that is really striking to the outsider, and that is the gauntlet of criticism that is considered acceptable or even desirable. The poor graduate student at his or her Ph.D. oral exam is subjected to a withering crossfire of questions that sometimes seem hostile or contemptuous; this from the professors who have the candidate's future in their grasp. The students naturally are nervous; who wouldn't be? True, they've prepared for it for years. But they understand that at that critical moment they really have to be able to answer questions. So in preparing to defend their theses, they must anticipate questions; they have to think, "*Where in my thesis is there a weakness* that someone else might find—because I sure better find it before they do, because if they find it and I'm not prepared, I'm in deep trouble."

You take a look at contentious scientific meetings. You find university colloquia in which the speaker has hardly gotten 30 seconds into presenting what she or he is saying, and suddenly there are interruptions, maybe withering questions, from the audience. You take a look at the publication conventions in which you submit a scientific paper to a journal, and it goes out to anonymous referees whose job it is to think, Did *you do anything stupid? If you didn't* do anything stupid, is there anything in here that is sufficiently interesting to be published? What are the deficiencies of this paper? Has it been done by anybody else? Is the argument adequate, or should you resubmit the paper after you've actually demonstrated what you're speculating on? And so on. And it's anonymous: You don't know who your critics are. You have to rely on the editor to send it out to real experts who are not overtly malicious. This is the everyday expectation in the scientific community. And those who don't expect it—even good scientists who just can't hold up under criticism—have difficult careers.

Why do we put up with it? Do we like to be criticized? No, no scientist likes to be criticized. Every scientist feels an affection for his or her ideas and scientific results. You feel protective of them. But you don't reply to critics: "Wait a minute, wait a minute; this is a really good idea. I'm very fond of it. It's done you no harm. Please don't attack it." That's not the way it goes. The hard but just rule is that if the ideas don't work, you must throw them away. Don't waste any neurons on what doesn't work. Devote those neurons to new ideas that better *explain the data. Valid criticism is* doing you a favor.

There is a reward structure in science that is very interesting: Our highest honors go to those who disprove the findings of the most revered among us. So Einstein is revered not just because he made so many fundamental contributions to science, but because he found an imperfection in the fundamental contribution of Isaac Newton. (Isaac Newton was surely the greatest physicist before Albert Einstein.)

Now think of what other areas of human society have such a reward structure, in which we revere those *who prove that the fundamental* doctrines that we have adopted are wrong. Think of it in politics, or in economics, or in religion; think of it in how we organize our society. Often, it's exactly the opposite: There we reward those who reassure us that what we've been told is right, that we need not concern ourselves about it. This difference, I believe, is at least a basic reason why we've made so much progress in science, and so little in some other areas.

We are fallible. We cannot expect to foist our wishes on the universe. So another key aspect of science is experiment. Scientists do not trust what is intuitively obvious, because intuitively obvious gets you nowhere. That the Earth is flat was once obvious. I mean, really obvious; obvious! Go out in a flat field and take a look: Is it round or flat? Don't listen to me; go prove it to yourself. That heavier bodies fall faster than light ones was once obvious. That blood-sucking leeches cure disease was once obvious. That some people are naturally and by divine right slaves was once obvious. That the Earth is at the center of the universe was once obvious. You're skeptical? Go out, take a look: Stars rise in the east, set in the west; here we are, stationary (do you feel the Earth whirling?); we see them *going around us. We are at the center;* they go around us.

"The least effective way for skeptics to get the attention of these bright, curious, interested people is to belittle, or condescend, or show arrogance toward their beliefs."

The truth may be puzzling. It may take some work to grapple with. It may be counterintuitive. It may contradict deeply held prejudices. It may not be consonant with what we desperately want to be true. But our preferences do not determine what's true. We have a method, and that method helps us to reach not absolute truth, only asymptotic approaches to the truth—never there, just closer and closer, always

finding vast new oceans of undiscovered possibilities. Cleverly designed experiments are the key.

In the 1920s, there was a dinner at which the physicist Robert W. Wood was asked to respond to a toast. This was a time when people stood up, made a toast, and then selected someone to respond. Nobody knew what toast they'd be asked to reply to, so it was a challenge for the quick-witted. In this case the toast was: "To physics and metaphysics." Now by metaphysics was meant something like philosophy—truths that you could get to just by thinking about them. Wood took a second, glanced about him, and answered along these lines: The physicist has an idea, he said. The more he thinks it through, the more sense it makes to him. He goes to the scientific literature, and the more he reads, the more promising the idea seems. Thus prepared, he devises an experiment to test the idea. The experiment is painstaking. Many possibilities are eliminated or taken into account; the accuracy of the measurement is refined. At the end of all this work, the experiment is completed and . . . the idea is shown to be worthless. The physicist then discards the idea, frees his mind (as I was saying a moment ago) from the clutter of error, and moves on to something else.

The difference between physics and metaphysics, Wood concluded, is that the metaphysicist has no laboratory.

• • •

Why is it so important to have widely distributed understanding of science and technology? For one thing, it's the golden road out of poverty for developing nations. And developing nations understand that, because you have only to look at modern American graduate schools—in mathematics, in engineering, in physics—to find, in case after case, that more than half the students are from other countries. This is something America is doing for the world. But it conveys a clear sense that the developing nations understand what is essential for their future. What worries me is that Americans may not be equally clear on the subject.

Let me touch on the dangers of technology. Almost every astronaut who has visited Earth orbit has made this point: I was up there, they say, and I looked toward the horizon, and there was this thin, blue band that's the Earth's atmosphere. I had been told we live in an ocean of air. But there it was, so fragile, such a delicate blue: I was worried for it.

In fact, the thickness of the Earth's atmosphere, compared with the size of the Earth, is in about the same ratio as the thickness of a coat of shellac on a schoolroom globe is to the diameter of the globe. That's the air that nurtures us and almost all other life on Earth, that protects us from deadly ultraviolet light from the sun, that through the greenhouse effect brings the surface temperature above the freezing point. (Without the greenhouse effect, the entire Earth would plunge below the freezing point of water and we'd all be dead.) Now that atmosphere, so thin and fragile, is under assault by our technology. We are pumping all kinds of stuff into it. You know about the concern that chlorofluorocarbons are depleting the ozone layer; and that carbon dioxide and methane and other greenhouse gases are producing global warming, a steady trend amidst fluctuations produced by volcanic eruptions and other sources. Who knows what other challenges we are posing to this vulnerable layer of air that we haven't been wise enough to foresee?

The inadvertent side effects of technology can challenge the environment on which our very lives depend. That means that we must understand science and technology; we must anticipate longterm consequences in a very clever way—not just the bottom line on the profit-and-loss column for the corporation for this year, but the consequences for the nation and the species 10, 20, 50, 100 years in the future. If we absolutely stop all chlorofluorocarbon and allied chemical production right now (as we're in fact doing), the ozonosphere will heal itself in about a hundred years. Therefore our children, our grandchildren, our great-grandchildren must suffer through the mistakes that we've made. That's a second reason for science education: the dangers of technology. We must understand them better.

A third reason: origins. Every human culture has devoted some of its intellectual, moral, and material resources to trying to understand where everything comes from—our nation, our species, our planet, our star, our galaxy, our universe. Stop someone on the street and ask about it. You will not find many people who never thought about it, who are incurious about their ultimate origins.

I hold there's a kind of Gresham's Law that applies in the confrontation of science and pseudoscience: In the popular imagination, at least, the bad science drives out the good. What I mean is this: If you are awash in lost continents and channeling and UFOs and all the long litany of claims so well exposed in the SKEPTICAL INQUIRER, you may not have intellectual room for the findings of science. You're sated with wonder. Our culture in one way produces the fantastic findings of science, and then in another way cuts them off before they reach the average person. So people who are curious, intelligent, dedicated to understanding the world, may nevertheless be (in our view) enmired in superstition and pseudoscience. You could say, Well, they ought to know better, they ought to be more critical, and so on; but that's too harsh. It's not very much their fault, I say. It's the fault of a society that preferentially propagates the baloney and holds back the ambrosia.

The least effective way for skeptics to get the attention of these bright, curious, interested people is to belittle, or condescend, or show arrogance toward their beliefs. They may be credulous, but they're not stupid. If we bear in mind human frailty and fallibility, we will understand their plight.

For example: I've lately been thinking about alien abductions, and false claims of childhood sexual abuse, and stories of satanic ritual abuse in the context of recovered memories. There

are interesting similarities among those classes of cases. I think if we are to understand any of them, we must understand all of them. But there's a maddening tendency of the skeptics, when addressing invented stories of childhood sexual abuse, to forget that real and appalling abuse happens. It is not true that all these claims of childhood sexual abuse are silly and pumped up by unethical therapists. Yesterday's paper reported that a survey of 13 states found that one-sixth of all the rape victims reported to police are under the age of 12. And this is a category of rape that is preferentially under-reported to police, for obvious reasons. Of these girls, one-fifth were raped by their fathers. That's a lot of people, and a lot of betrayal. We must bear that in mind when we consider patients who, say, because they have an eating disorder, have suppressed childhood sexual abuse diagnosed by their psychiatrists.

People are not stupid. They believe *things for reasons. Let us not dismiss* pseudoscience or even superstition with contempt.

In the nineteenth century it was mediums: You'd go to the séance, and you'd be put in touch with dead relatives. These days it's a little different; it's called channeling. What both are basically about is the human fear of dying. I don't know about you; I find the idea of dying unpleasant. If I had a choice, at least for a while, I would just as soon not die. Twice in my life I came very close to doing so. (I did not have a near-death experience, I'm sorry to say.) I can understand anxiety about dying.

About 14 years ago both my parents died. We had a very good relationship. I was very close to them. I still miss them terribly. I wouldn't ask much: I would like five minutes a year with them; to tell them how their kids and their grandchildren are doing, and how *Annie and I are doing. I know it* sounds stupid, but I'd like to ask them, "Is everything all right with you?" Just a little contact. So I don't guffaw at women who go to their husbands' tombstones and chat them up every now and then. That's not hard to understand. And if we have difficulties *on the ontological status of who it is* they're talking to, that's all right. That's not what this is about. This is humans being human.

In the alien-abduction context, I've been trying to understand the fact that humans hallucinate—that it's a human commonplace—yes, under conditions of sensory deprivation or drugs or deprival of REM sleep, but also just in the ordinary course of existence. I have, maybe a dozen times since my parents died, heard one of them say my name: just the single word, "Carl." I miss them; they called me by my first name so much during the time they were alive; I was in the practice of responding instantly when I was called; it has deep psychic roots. So my brain plays it back every now and then. This doesn't surprise me at all; I sort of like it. But it's a hallucination. If I were a little less skeptical, though, I could see *how easy it would be to say, "They're* around somewhere. I can hear them."

Raymond Moody, who is an M.D., I think, an author who writes innumerable books on life after death, actually quoted me in the first chapter of his latest book, saying that I heard my parents calling me Carl, and so, look, *even he believes in life after death. This* badly misses my point. If this is one of the arguments from Chapter 1 of the latest book of a principal exponent of life after death, I suspect that despite our most fervent wishes, the case is weak.

But still, suppose I wasn't steeped in the virtues of scientific skepticism and felt as I do about my parents, and along comes someone who says, "I can put you in touch with them." Suppose he's clever, and found out something about my parents in the past, and is good at faking voices, and so on—a darkened room and incense and all of that. I could see being swept away emotionally.

Would you think less of me if I fell for it? Imagine I was never educated about skepticism, had no idea that it's a virtue, but instead believed that it was grumpy and negative and rejecting *of everything that's humane. Couldn't* you understand my openness to being conned by a medium or a channeler?

The chief deficiency I see in the skeptical movement is its polarization: Us vs. Them—the sense that we have a monopoly on the truth; that those other people who believe in all these

On Sober Reflection . . .

I'm pleased to have been associated for a long time with the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP). When the SKEPTICAL INQUIRER arrives, I always take it home from the office and pore through its pages, wondering what new misunderstandings will be revealed. I'm always amazed that there's still another subject that I never thought of. Crop circles! Aliens have come and made mathematical messages—in wheat! Who would have thought it? So unlikely an artistic medium. Or they've come and eviscerated cows—on a large scale, systematically. Farmers are furious. I'm often impressed by the depths of inventiveness that the new stories that are debunked in SKEPTICAL INQUIRER reveal. But then, on more sober reflection, it always strikes me how unimaginative most of these stories are; how, compared with the unexpected findings of science, they have a kind of dreariness about them, stale ideas, chauvinisms, hopes and fears dressed up as facts, a reflection of people who imagine that what pops into their heads can be more stunning than what Nature provides us with every day. In almost every case, I have this second thought: That's all they can imagine the extraterrestrials doing—making circles in hay? —C.S.

stupid doctrines are morons; that if you're sensible, you'll listen to us; and if not, to hell with you. This is nonconstructive. It does not get our message across. It condemns us to permanent minority status. Whereas, an approach that from the beginning acknowledges the human roots of pseudoscience and superstition, that recognizes that the society has arranged things so that skepticism is not well taught, might be much more widely accepted.*

If we understand this, then of course we have compassion for the abductees and those who come upon crop circles and believe they're supernatural, or at least of extraterrestrial manufacture. This is key to making science and the scientific method more attractive, especially to the young, because it's a battle for the future.

Science involves a seemingly self-contradictory mix of attitudes: On the one hand, it requires an almost complete openness to all ideas, no matter how bizarre and weird they sound, a propensity to wonder. As I walk along, my time slows down; I shrink in the direction of motion, and I get more massive. That's crazy! On the scale of the very small, the molecule can be in this position, in that position, but it is prohibited from being in any intermediate position. That's wild! But the first is a statement of special relativity, and the second is a consequence of quantum mechanics. Like it or not, that's the way the world is. If you insist that it's ridiculous, you will be forever closed to the major findings of science. But at the same time, science requires the most vigorous and uncompromising skepticism, because the vast majority of ideas are simply wrong, and the only way you can distinguish the right from the wrong, the wheat from the chaff, is by critical experiment and analysis.

Too much openness and you accept every notion, idea, and hypothesis—which is tantamount to knowing nothing. Too much skepticism—especially rejection of new ideas before they are adequately tested—and you're not only unpleasantly grumpy, but also closed to the advance of science. A judicious mix is what we need.

It's no fun, as I said at the beginning, to be on the receiving end of skeptical questioning. But it's the affordable price we pay for having the benefits of so powerful a tool as science.

Copyright ©1994 by Carl Sagan

*If skeptical habits of thought are widely distributed and prized, then who is the skepticism going to be mainly applied to? To those in power. Those in power, therefore, do not have a vested interest in everybody being able to ask searching questions.

7th European Skeptics Conference: in Rossdorf, Germany

The central theme at the 7th European Skeptics Conference will be the influence of fringe-science on society, politics, and culture. A number of other controversial themes will be addressed, including fringe medicine (homeopathy), faith healing, problems of perception and memory, pseudoscience and the philosophy of science, and current paranormal claims.

Date: May 4-7, 1995
Location: Rossdorf (near Darmstadt, Germany) about an hour by bus from Frankfurt Airport.
Languages: English and German

Speakers include John Maddox (Chief Editor, *Nature*), Professor Gerhard Vollmer (philosopher), Dr. Barbara Burkhardt (medical insurance issues), Paul Kurtz (CSICOP Chairman), and James Randi.

Registration
Registrations before February 28:
DM 95, Students DM 45
Late registration surcharge: DM 20
Proceedings: DM 20 special rate for participants only
(current rates: 1US$ = DM 1.55)

Proceedings
Conference papers will be published as proceedings

Please contact:
GWUP
Postfach 1222
D-64374 Rossdorf
Germany
Tel. +49 6154 695021
Fax +49 6154 695022

Or call Barry Karr, CSICOP Exeuctuve Director at 716-636-1425

Conference Schedule (in English language unless noted otherwise)

Thursday, May 4
ECSO meeting, reception, welcome address, and keynote speech.

Friday, May 5
The two morning sessions will discuss pseudoscience (in German) and for non-German-speaking participants, an excursion is planned to the Messel pit, a trip 50 million years into the past. Following lunch will be two sessions on fringe science in Europe. The evening entertainment will consist of magic, music, and sketches.

Saturday, May 6
The morning session will focus on the problems of perception and memory and will be followed by a discussion of fraud and self-deception in science. Workshops will follow lunch and a panel session discussing the formation of a lobby against fringe science. A banquet will be held in the evening.

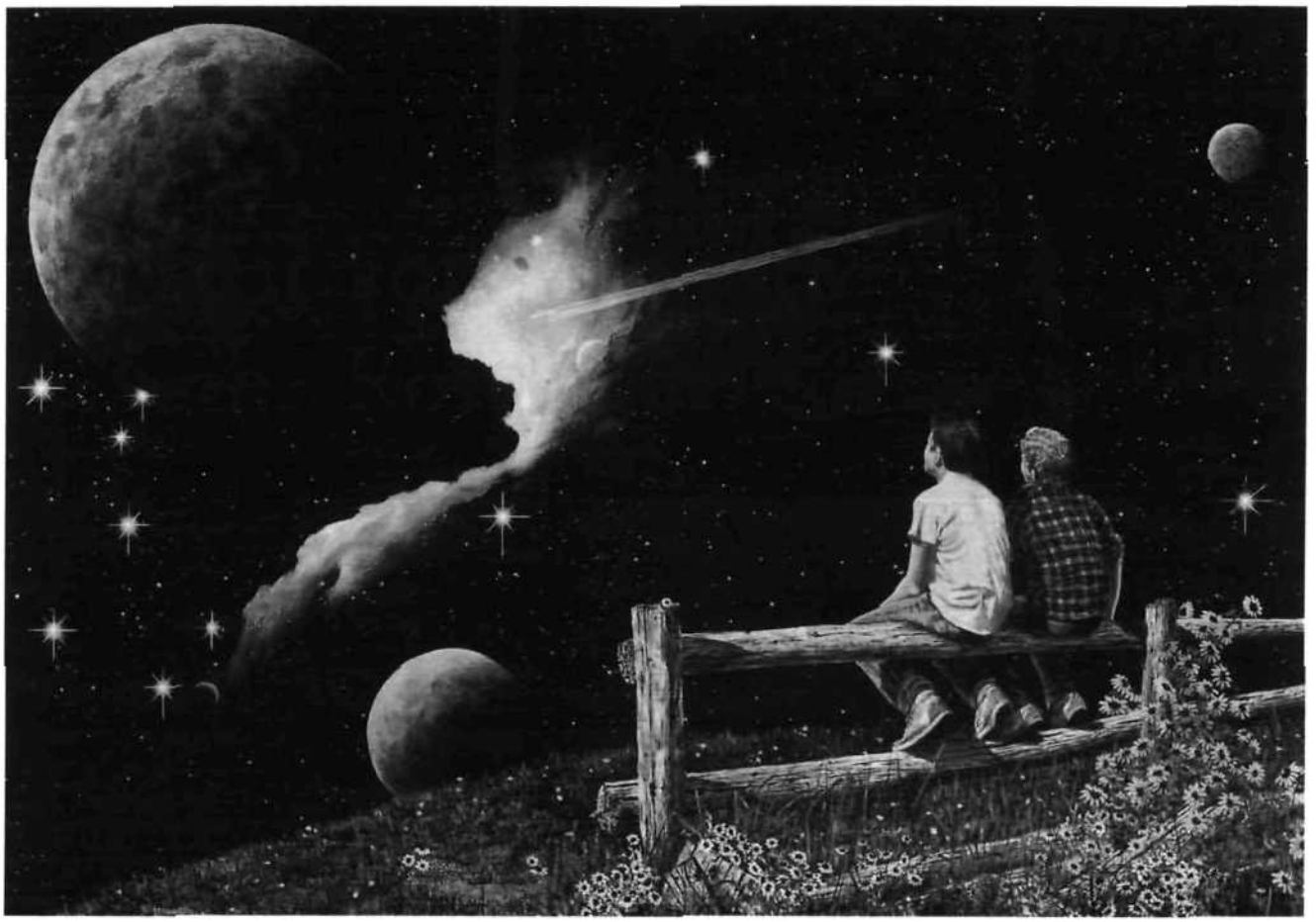
Sunday, May 7
The morning session will discuss the promotion of science as a protection against pseudoscience. A GWUP members meeting will be held following the close of the conference.

Putting Away Childish Things

RICHARD DAWKINS

Gullibility, a childhood survival skill, is harmful for adults.

On April Fools' Day one year when my sister and I were children, our parents and uncle and aunt played a simple trick on us. They announced that they had procured a little airplane for us and were going to take us up for a ride. The only stipulation was that we had to be blindfolded. They led us by the hand, stumbling across the lawn, and strapped us into our seat. We heard the noise of the engine starting up. There was a lurch, and up we went for a bumpy, swaying, reeling ride. From time to time we evidently passed through the high treetops, for we felt the branches gently brushing us, and there was a pleasant rushing wind in our faces. Finally we "landed," the lurching ride came to an end on terra firma, the blindfold was removed and, amid laughter, all was revealed. There was no airplane. We had not traveled from the spot on the lawn where we started. We had simply been



Warp Speed by Leonard Parkin

sitting on a garden seat that our father and uncle had lifted and slewed and bumped around to simulate aerial movement. No engine, only the vacuum cleaner to make a noise and blow wind in our faces. That and the tree branches brushing against us had been wielded by my mother and aunt standing by the seat. It had been fun while it lasted.

Credulous, faith-filled children that we were, we had looked forward to this flight for days before it happened. It never occurred to us to wonder why we must be blindfolded for our flight. Wouldn't it have been natural to ask what the point was of going for a joyride if you couldn't see anything? But no, our parents simply told us that, for some unspecified reason, they had to blindfold us, and we accepted it. We never wondered why our elders had kept from us that at least one of them was a trained pilot—I don't think we even asked which one. We didn't wonder where, in the house or garden, every nook of which we played in daily, an airplane big enough to carry us had been concealed. We just didn't have the skeptic's turn of mind. Moreover we had no fear of crashing, such was our faith in our parents. And when the blindfolds were removed and the joke was on us, we still didn't stop believing in Santa Claus, the tooth fairy, angels, and the other stories that our elders had told us. Incidentally, my mother has no memory of this incident, though she does vividly remember the occasion when her own father played the identical trick on her and her little sister. His patter was even more unbelievable because the plane "took off" indoors and the children had to duck as they "flew out through the window." She and her sister still fell for it.

Children are naturally credulous. Of course they are, what else would be sensible? They arrive in the world knowing nothing, surrounded by adults who know, by comparison, everything. So much of what a child is told turns out to be true and wise. It is certainly true that fire scorches, that snakes bite, that if you are white and walk unprotected in the noonday sun you will go red and raw. Moreover, learning by trial and error—the other, and apparently more scientific, way to gain useful knowledge—is often a bad idea because the errors are too costly. If your mother tells you never to paddle in the lake because of the crocodiles, it is no good coming over all skeptical and scientific and "adult" and saying:

Richard Dawkins is Reader in Zoology at the University of Oxford, U.K., and author of The Selfish Gene, The Extended Phenotype, and The Blind Watchmaker. *This article is based upon a chapter originally written for the author's forthcoming book to be published by W. W. Norton, New York, under the provisional title* Climbing Mount Improbable.

"Thank you, Mother, but I prefer to put it to the experimental test." Too often, an experiment like that would be the last thing a child ever did. It is easy to see why natural selection—the "survival of the fittest"—might penalize an experimental and skeptical turn of mind and favor simple credulity in children.

But this has an unfortunate by-product that can't be helped. If your parents tell you something that is not true, you will believe that too. How could you not? A child isn't equipped to know the difference between a true warning about crocodiles if you paddle in the lake and a false warning about going blind if you "sin." Credulity, as a survival device, comes as a complete package. You believe everything, the false with the true. Parents and elders know so much, it is natural to assume that they know everything, natural to believe them. So when they tell you about Santa Claus coming down the chimney, and about God answering good children's prayers, and about faith "moving mountains," you believe that too.

Children are gullible because they need to be to fulfill their role in life. Butterflies have wings to fulfill their role of locating members of the opposite sex and spreading their offspring to new food plants. They have modest appetites that are satisfied by occasional sips of nectar. They eat little protein because to grow is not part of their role in life. The growing role is fulfilled by the caterpillar stage in their life history. Juvenile animals have a special role in life. It is to prepare to become successfully reproducing adults. Caterpillars are there to feed as rapidly as possible in order to metamorphose into flying, reproducing, dispersing adults. To this end they have no wings but instead have stout, munching jaws and voracious, single-minded appetites.

Children need to be credulous for a similar reason. Their role in life is to grow up to become adults in a sophisticated, knowledge-based society. Think of them as information-caterpillars. And by far the most important source of their information diet is their elders, above all their parents. For the same kind of reason that caterpillars have chumbling, hoovering jaws for sucking up cabbage flesh, human children have wide open ears and eyes and gaping, trusting, minds for sucking up language and other knowledge. Tidal waves of information, gigabytes of data, flood through the portals of the infant skull, and most of it originates in the culture built up by parents and generations of ancestors.

Naive credulity, as a childhood survival device, raises a further problem. What if two adults, say your mother and your father, give you contradictory advice? What if your mother tells you that all snakes are deadly and you must never go near them, but next day your father tells you that all snakes are deadly except green ones and you can keep a green snake as a pet and play with it? Both pieces of advice may be good. The mother's more general advice has the desired effect of protecting you against snakes, even though it is not true when it comes to green snakes. The father's more discriminating advice has the same protective effect and is in some ways better, but it could lead to misunderstanding: to the young child the two might sound contradictory. Parents often make strenuous efforts not to contradict each other in this way, and they are probably wise to do so. But natural selection, in "designing" credulity, would need to build in a way of coping with contradictory advice. Perhaps a simple override rule, such as "Believe whichever story you heard first." Or "Believe your mother rather than your father, and your father rather than other adults in the population."

Sometimes the advice from parents is specifically aimed against credulity toward other adults in the population. The following is a piece of advice that parents nowadays would do well to give their children: "If any adult asks you to come with him and says that he is a friend of your parents, don't believe him however nice he seems and even if he offers you sweets. Only go with adults that you and your parents already know." A child may be called upon to exercise the exact opposite of credulity in some circumstances: a tenacious persistence in believing an earlier adult statement, in the face of what may be a tempting and plausible—but contradictory—later statement. The quality of childhood that I am trying to pin down is not pure gullibility but a complex combination of initial gullibility followed by stubborn persistence in a belief, once acquired.

"Credulity as a survival tool comes as a complete package. You believe everything, the false with the true."

The years of childish innocence pass too soon. I love my parents for taking me for a ride, high as a kite, through the treetops; and for telling me about the tooth fairy and Santa Claus and Baby Jesus too. All these stories enriched my childhood and, together with so many other things, helped to make it, in memory, a time of lost, Arcadian enchantment. There is joy and charm in the near infinite gullibility of children. The genius of the human child, mental caterpillar extraordinary, is for soaking up information and ideas, not for criticizing them. The blotting paper of the child's brain is the unpromising seedbed, the base upon which later, if it comes at all, the skeptical attitude, like a struggling mustard plant, may grow. A major part of growing up ought to consist in the cultivation of the delicate seedling of skepticism. And unfortunately all too many people never really, in this sense, grow up at all.

Adult human gullibility can extend to near incredible lengths. I am looking at a "news" story—"Mum Gives Birth to 8-lb. Kitten"—from a paper called *Sunday Sport*, which like its American equivalents, such as the *National Enquirer*, is almost entirely devoted to

printing tall stories as if they were fact. On the following page the *Sunday Sport* carries an article about a magician who couldn't stand his wife's nagging so he turned her into a rabbit. In addition to this pandering to the prejudiced cliché of the nagging wife, this issue of *Sunday Sport* seems to add a xenophobic flavor to its fantasies: "Mad Greek Turns Boy into Kebab" (this is literally what a tavern proprietor is alleged to have done, and he then served the boy up to his customers); "Super Rats Plague Frogs" (mutant rats three-feet long are coming up from their breeding grounds in the sewers of Paris and tormenting the "filthy Frogs"); and "Priest Finds World's Smelliest Tribesmen" (the "Underarhmwali" tribe of New Guinea).

Steven Pinker, in his brilliant book, *The Language Instinct,* quotes two stories from a particular issue of an American journal called *The Sun:* "Family Haunted by Ghost of Turkey They Ate for Christmas" and "Baby Born Talking Describes Heaven—Incredible Proof of Reincarnation." The second article goes on: "Life in heaven is grand, a baby told an astounded obstetrical team seconds after birth. Tiny Naomi Montefusco literally came into the world singing the praises of God's firmament. The miracle so shocked the delivery room team, one nurse ran screaming down the hall." Naomi's mother was much moved: "I tried to get off the delivery table to kneel down and pray, but the nurses wouldn't let me." Other well-loved stories from these papers include "Marilyn Monroe Comes Back as a Lettuce" (complete with green-tinted photograph of the late screen goddess's face nestling in the heart of a lettuce) and "Statue of Elvis Found on Mars."

The writers of these papers do not, I imagine, believe their own stories, but they do know their readership. Presumably at least a good proportion of the readers of these papers must have the almost superhuman gullibility necessary to believe them, otherwise what is the point of printing them and trying to sell them? The circulation of the *National Enquirer* is more than four million. Even relatively respectable newspapers pay salaries to astrologers.

Don't misunderstand me. It would be all too easy to read me as complacently claiming that our present scientific knowledge is all there is to know, and that you can be sure that astrology, spirits, and the rest are rubbish without further discussion, simply because existing science cannot explain them. Is it, after all, so obvious that there are no fairies, that levitation and astrology are a load of bunk? How do I know, so positively, that a human mother didn't give birth to an 8-pound kitten? How can I be sure that Elvis Presley has not ascended from the dead in glorious resurrection? Stranger things than ghosts exist. Or, to be more precise, things that we accept as commonplace, such as radio communication, would have seemed, to our ancestors, every bit as strange and surprising as spirits. As Arthur C. Clarke, the distinguished science-fiction writer and evangelist for the limitless power of science and technology, has said, "Any sufficiently advanced technology is indistinguishable from magic." This has been called Clarke's Third Law, and I shall use this name in what follows.

"The quality of childhood that I am trying to pin down is . . . a complex combination of initial gullibility followed by stubborn persistence in a belief."

William Thomson, the first Lord Kelvin, was one of the most distinguished and influential of nineteenth-century British physicists. He was a thorn in Darwin's side because he "proved," with massive authority but, as we now know, equally massive error, that the earth was too young for evolution to have occurred. He is also credited with the following three confident predictions: "Radio has no future," "Heavier-than-air flying machines are impossible." "X-rays will prove to be a hoax." Here was a man who took skepticism to the point where he courted—and earned—the ridicule of future generations. Arthur Clarke himself, in his visionary book, *Profiles of the Future,* tells similar cautionary tales—awful warnings of the dangers of dogmatic skepticism. When Edison announced that he was working on a project to develop electric light, a British Parliamentary Commission was set up to investigate whether there was anything in the idea. The committee of experts reported that the idea (what we now call the electric light bulb) was "good enough for our transatlantic friends . . . but unworthy of the attention of practical or scientific men." Lest this sound like an anti-British series of stories, Clarke also quotes two distinguished American scientists on the subject of airplanes. The astronomer Simon Newcomb was unwise enough to remark, only shortly before the Wright brothers' famous exploit: "The demonstration that no possible combination of known substances, known forms of machinery and known forms of force, can be united in a practical machine by which men shall fly long distances through the air, seems to the writer as complete as it is possible for the demonstration of any physical fact to be."

Another noted American astronomer, William Henry Pickering, categorically stated that, although heavier-than-air flying machines were possible (he had to say that because the Wright brothers had by then already flown), they could never be a serious practical proposition: "The popular mind often pictures gigantic flying machines speeding across the Atlantic and carrying innumerable passengers in a way analogous to our modern steamships. . . . It seems safe to say that such ideas must be wholly visionary, and even if a machine could get across with one or two passengers the expense would be prohibitive. . . . Another popular fallacy is to expect enormous speed to be obtained." Pickering goes on to

"prove," by means of authoritative calculations on the effects of air resistance, that airplanes could never travel faster than the express trains of his day.

These stories are, indeed, awful warnings of the dangers of an overzealous skepticism. Dogmatic skepticism of anything that seems strange or different from what we are used to is clearly not a virtue. What, then, is the difference between this and my avowed skepticism of fairies, astrology, and the resurrection of a Martian Elvis Presley and a vegetable Marilyn Monroe? How are we to know when skepticism is justified and when it is dogmatic, intolerant short-sightedness?

There are various ways to answer this challenge. My favorite is to point out that Clarke's Third Law doesn't work in reverse. Given that "any sufficiently advanced technology is indistinguishable from magic," it does not follow that "any magical claim that anybody may make at any time is indistinguishable from a technological advance that will come some time in the future." As we have seen, there have admittedly been occasions when authoritative, pontificating skeptics have come away with egg on their faces, even within their own lifetimes. But there have been a far greater number of occasions when magical claims have never been vindicated. An apparently magical claim might eventually turn out to be true. In any age there are so many magical claims that are, or could be, made. They can't all be true; many are mutually contradictory; and we have no reason to suppose that, simply by the act of sitting down and dreaming up a magical claim, we shall make it come true in some future technology. Some things that would surprise us today will come true in the future. But lots and lots of things that would surprise us today will not come true ever.

You might ask yourself whether a storyteller has a motive to lie. Or we can look at his credentials in other ways. I was once placed at dinner next to an entertaining philosopher who told me the following story. He was kneeling in a church next to a priest. Turning to look at his companion he observed that the priest, still in a kneeling position, had levitated himself and was hovering nine inches above the church floor. My natural skepticism of my dinner companion increased when I gathered further evidence on his credentials as a witness. He went on to tell me of two other eyewitness experiences. He said that, among his many careers, he had once been warden of a home for delinquent boys, and he discovered that all the boys had "I love my Mummy" tattooed on their penises. An improbable story in itself, but not impossible. No great scientific principles would be violated if it were true. Nevertheless, it seemed to provide a useful perspective on the credentials of this man as an observer of priests hovering in the nave. Moreover, said my dinner companion, he had once observed a crow pick up a match it found on the ground, strike it, and raise its wing to shield the lighted match from the wind. I forget whether the crow actually took a drag on the cigarette, but in any case the three stories, taken together, seemed to me to establish my companion as an unreliable, though diverting, witness. To put it mildly, the hypothesis that he was a liar (or a lunatic, or a hallucinating fantasist, or doing psychological research on credulity) seemed more probable than the alternative hypothesis that all three of his far-fetched stories were true. Three improbable occurrences are much more improbable than one. If a man tells one lie, on the other hand, this does not diminish the probability that he will tell two more!

Is there anything that we can safely rule out, and for all time? Physicists all agree that if an inventor applies for a patent for a perpetual-motion machine you can safely turn down his patent without even looking at his design. This is because any perpetual-motion machine would violate the second law of thermodynamics, which physicists regard as having a special status, beyond the reach of any future technology, no matter how bizarre. Arthur Eddington, the great astronomer and popularizer of science, wrote, in his characteristically beautiful style: "If someone points out to you that your pet theory of the universe is in disagreement with Maxwell's equations—then so much the worse for Maxwell's equations. If it is found to be contradicted by observation—well, these experimentalists do bungle things sometimes. But if your theory is found to be against the second law of thermodynamics I can give you no hope; there is nothing for it but to collapse in deepest humiliation."

"Existing science must not be overthrown by casual anecdotes but by the most rigorous research, repeated, dissected, and repeated again."

Eddington is cleverly bending over backward to make concessions in the first part of the passage, so that his confidence in the second part has the more impact. But if you still find it too cocksure, if you think it is asking for trouble at the hands of some as yet unimaginable future technology, so be it. I won't press the point, but will take my weaker stand on relative probabilities. Fraud, illusion, trickery, hallucination, honest mistake, or outright lies—the combination of these adds up to such a probable alternative that I shall always doubt casual observations or stories that seem to suggest the catastrophic overthrow of existing science. Existing science must be overthrown not by casual anecdotes but by the most rigorous research, repeated, dissected, and repeated again.

To return to my main thesis, it is that gullibility of the kind exploited by astrologers, evangelists, and other charlatans may be normal and healthy in a child, but it is unhealthy and reprehensible in an adult. Growing up, in the fullest sense of the word, should include the cultivation of a healthy

skepticism. The active willingness to be deceived can be called childish not only because it is common—and defensible—among children. I suspect, too, that the explanation for its existence in adults lies in a hankering after, indeed a pining for, the lost securities and comforts of childhood. As Isaac Asimov put it, "Inspect every piece of pseudoscience and you will find a security blanket, a thumb to suck, a skirt to hold." Childhood is, for many people, a time of enchantment, a kind of heaven. As little Naomi, the talking neonate, said to her obstetrician when he held her up and rudely cut her umbilical cord: "Heaven is a beautiful place, so warm and serene. Why did you bring me here?" Childhood, we might say, with its certainties and its securities, its fantasies of flying to Never-Never Land, its bedtime stories of Fairyland and Toyland before we drifted off to the Land of Nod in the arms of Teddy Bear, was so warm and serene. Why, the reluctant adult might complain, did you drag me here?

> That is the land of lost content,
> I see it shining plain,
> The happy highways where I went
> And cannot come again.
>
> (A. E. Housman:
> *A Shropshire Lad*)

Yes, childhood is a time of enchantment. But maturity has its charms too, and a proper understanding of the universe and our place in it has a special grown-up kind of appeal. The universe may be a cold and empty place, with no fairies and no Santa Claus, no Toyland or Narnia, no Happy Hunting Ground where mourned pets go, and no angels, guardian or garden variety. But there are also no devils, no hellfire, no wicked witches, no ghosts, no haunted houses, no demonic possession, no bogeymen or ogres. Yes, Teddy and Golly turn out not to be really alive. But there are warm, live, speaking, thinking adult bedfellows to love, and many people find it a more rewarding kind of love than the childish love of stuffed toys, however soft and cuddly they may be.

If we don't grow up properly, we retain our "obstinate caterpillar" quality from childhood, when it is a virtue, into adulthood, when it becomes a vice. In childhood our credulity serves us well. It helps us to pack, with extraordinary rapidity, our skulls full of the wisdom of our parents and our ancestors. But if we don't grow out of it in the fullness of time, our caterpillar nature makes us a sitting target for astrologers, mediums, gurus, evangelists, and quacks. We need to replace the automatic credulity of childhood with the constructive skepticism of adult science. □

CSICOP LEGAL DEFENSE FOUNDATION

In the Winter 1992 issue of the SKEPTICAL INQUIRER we outlined the difficulties that the Committee for the Scientific Investigation of Claims of the Paranormal is experiencing because of harassing lawsuits filed against skeptics.

We feel confident that these suits will eventually be dismissed. Still, we suspect that the lawsuits were brought for reasons other than the redress of alleged grievances.

For what do these suits mean? They mean that the pro-paranormalists think they have finally found a way to strike below the belt of scientists and skeptics. For years they have been unable to prove their claims of miraculous abilities. They've grown tired of hearing our challenges. Now they have turned to intimidation by lawsuit in an effort to silence their only persistent critics.

It doesn't matter if the plaintiff wins or loses the suit. Their purpose is to waste their opponents' resources and to intimidate and silence them—in effect, depriving individuals or organizations of their First Amendment rights.

We are by no means a wealthy organization, but we are not prepared to surrender our rights. *We have vowed to fight back.* To do so, we need your support. CSICOP has established the CSICOP Legal Defense Foundation. Its funds will be used to help pay the costs of existing lawsuits and any that may arise in the future, and to countersue when appropriate.

Don't allow the claim-mongers to destroy CSICOP (and the values of science and reason it steadfastly represents) through unjust and frivolous legal proceedings. Support the CSICOP Legal Defense Foundation today. It's the best way to blunt this frightening new weapon of the apostles of nonsense.

Help Us Defend Skepticism Against Harassing Suits

Yes, I want to defend the rights of skeptics. Enclosed is my tax-deductible contribution of $_____

Please make checks payable to the
CSICOP Legal Defense Foundation

Charge my ☐Visa ☐MasterCard ☐Check enclosed

#_____ Exp._____

Sig._____

Credit Card holders may call toll free: **1-800-634-1610**

Name _____

Address _____

City _____ State _____ Zip _____

Mail to:
CSICOP Legal Defense Foundation
Box 703, Amherst, NY 14226

Science, Soul, and the Astonishing Hypothesis

FRANCIS CRICK

Is there some soul, or spirit, that science cannot explain that survives our physical death? Or is it all in the brain?

Will we ever understand how our brains work? We know that the human brain is incredibly complex and that its activity is always changing. Parts of its structure are continually being modified, or you could not remember what you did yesterday. We know that different regions of it specialize—in seeing, hearing, initiating movements, and so on—and that these parts interact together to produce our behavior. Or is there something more? Is there some soul, or spirit, that science cannot explain, without which we would not be conscious and which survives our physical death?

Many people believe that there must be, because they cannot see how the activity of nerve cells can possibly explain what philosophers call "qualia"; for example, the painfulness of pain or the redness of red. What I have called the Astonishing Hypothesis says, on the contrary,

that it's all due to the activities of nerve cells (and associated cells and molecules). This idea—that it's all in the brain—is not new; it goes back at least as far as Hippocrates, who lived around 400 B.C. How can we find out if it is true?

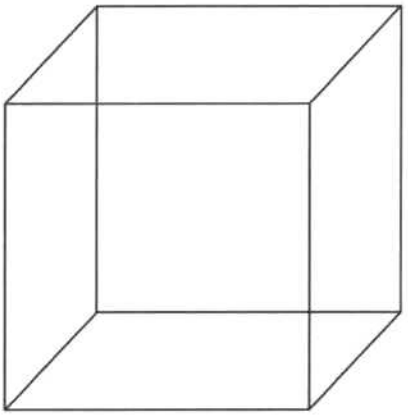
I believe that we now know enough about psychology, and about the brain, to begin to tackle this problem scientifically in a serious manner. Two approaches are possible. One is to consider *all* aspects of consciousness, such as pain, seeing, thinking, self-consciousness, and "other forms of consciousness," such as the hypnotic state, mystical experiences, and transcendental meditation. My colleague Christof Koch and I prefer a more focused approach. We believe that if we could explain just *one* aspect of consciousness, we would have gone a long way toward understanding them all. As a personal choice we selected the visual system, for various technical reasons. The problem can then be stated very simply: Exactly what is happening in my head when I see something?

Seeing is not as straightforward a process as you might think. It all seems so easy, but in fact we know that the visual information from your eyes has to undergo a large amount of intricate processing in your brain before you can see an object or an event. Look at the illustration (called a Necker cube). This obviously consists of a number of black lines on the white page. Yet you will almost certainly see it also as a drawing of a three-dimensional (3D) cube. You can see this with only one eye, but if you were to look at a real cube, with both eyes, it would appear even more vividly in 3D, although each eye gets only a 2D view of it. Your brain uses the small difference between these two views to help form a 3D "image" of it.

Francis Crick is at the Salk Institute for Biological Studies, La Jolla, CA 92037. A physicist in origin, he was awarded the Nobel Prize in 1962 (with James D. Watson and Maurice H. F. Wilkins) for his work in elucidating the double-helix structure of DNA. His most recent book is The Astonishing Hypothesis.

In short, your brain *constructs* what you see from the incoming information and from your past experience (and from the experience of your ancestors embodied in your genes). Sometimes, as in visual illusions, it can be fooled into making the wrong guess, but usually it does a pretty good job. You are not conscious of all this complicated activity in your brain—only of the results, and they are constantly changing as your attention moves around.

How should one think about seeing? Obviously there is not a little TV screen inside your head emitting light. But why should there not be a screen made of nerve cells? The activity of each nerve cell would represent the light at that point—very active for a bright spot, inactive for a dark spot (or something along those lines). But how could you see a face? Recall, the



Necker's cube has two possible 3D interpretations. But what is happening in the brain as you stare at it?

Astonishing Hypothesis says there is no one (no "homunculus") looking at the screen. All your brain would "see" on such a screen would be the little spots. To see a face, there have to be nerve cells that respond to faces, not just to spots. And indeed, when we look inside a monkey's head, we find such cells. In the same way, if, in a simple and direct way, you see movement, there must be nerve cells that respond to such movement. And, again, inside the monkey's head we find two small areas (one on each side of the head) that respond especially to moving objects in our field of view. Recent imaging experiments have located two similar areas in the *human* brain.

What happens if, due to a stroke, these areas are destroyed? Such a patient can see shapes and colors but can hardly see movement. A moving car appears stationary (just as a moving hour hand on a clock appears to us to be stationary), yet when she looks again the car will be in a different position. Many people find this extraordinary. If the car is moving, and she can see the car, why can't she see that it's moving? But from our ideas of how the brain works, this is just what we expect.

So the first thing to do is to find the "neural correlate" of what we see. This is not any old activity of the brain. Most of the early experiments on the visual system of animals were done on anesthetized animals that were not seeing anything at all, yet there were plenty of active neurons in the visual parts of their brains. To see, there must be some *special* sort of neural activity. How can we find out what this is?

One promising way is to do experiments in which the visual input is constant but the percept—what you see—changes. Look again at the Necker cube. Keep staring at it, and you will almost certainly see a different view of it. After a while, you will see again the view you saw first—and so on. There are two possible 3D interpretations of the drawing, both almost equally likely, and so the brain hops from one to the other. So we can ask: What changes in your brain when the percept changes? Experiments of this type (though with a different stimulus) are already being done on monkeys; and the results, although very preliminary, certainly look promising.

So let us assume that, in the fullness of time, we do discover the neural correlate of consciousness (now referred to as NCC), and not only of seeing, but of all the other forms of consciousness. And that we also understand the mechanisms of attention, and of very short-term memory (since we could hardly be conscious without it), and of how our perceptions are linked to the various levels of the motor system that plan

Science continued on page 61

The Positive Power of Radioisotopes

GLENN T. SEABORG

Radioisotopes have alleviated suffering and prolonged the lives of millions of human beings and contributed productively in many other ways.

The nation's news media have featured during the past year horrifying detailed accounts of "experiments" involving injections or ingestions of radioactive isotopes into human beings up to a half-century ago by medical scientists. Some of these involved University of California scientists who were pioneers—in fact, the originators—of nuclear medicine.

The UC scientists included John H. Lawrence (the brother of Ernest O. Lawrence, inventor of the cyclotron), who can perhaps be characterized as the "father" of nuclear medicine; Robert S. Stone, who had served impressively as the director of health for the wartime Plutonium Project; and Joseph G. Hamilton, the developer of much of nuclear medicine, including the use of radioactive iodine-131. Their trailblazing work in establishing the foundation for nuclear medicine

was carried on very much in accordance with the ethical standards of that time. Perhaps the accepted standards of our nuclear medical research today will horrify our descendants another half-century into the future.

Rather than elaborating on the morality of this pioneering research by UC scientists (of which I had no knowledge at the time), I am going to describe some of the marvelous consequences of its laying the foundation for nuclear medicine. (I shall also mention some of the other beneficial uses of radioactive isotopes.) Of the 30 million people who are hospitalized each year in the United States, one in three is treated with nuclear medicine. More than 10 million nuclear-medicine procedures are performed on patients and more than 100 million nuclear-medicine tests are performed each year in the United States alone. A comparable number of such procedures are performed in the rest of the world.

The most used such radioisotopes were discovered at UC Berkeley using the cyclotrons of E. O. Lawrence. Confining my remarks to some of those of which I have been a codiscoverer, with my Berkeley coworkers, I shall mention first iodine-131 (discovered in 1938), cobalt-60 (1937), and technetium-99m (1938). By 1970, 90 percent of the 8 million administrations a year of radioisotopes in the United States utilized either iodine-131, cobalt-60, or technetium-99m. Cobalt-60 was used annually for more than 4 million therapeutic irradiations, iodine-131 for diagnosis and treatment more than 2 million times a year, and technetium-99m in nearly 1 million annual diagnostic procedures. The statistics today are somewhat different. For example, technetium-99m is now the workhorse of nuclear medicine, accounting for more than 7 million diagnostic procedures a year in the United States, in bone, liver, and lung scanning and thyroid, cardiovascular, and brain imaging.

"The use of dozens of radioisotopes in nuclear medicine was only made possible by testing their efficacy on human beings."

All of this and the use of dozens of other radioisotopes in nuclear medicine were only made possible by testing their efficacy on human beings. (I dare not refer to this as "human experimentation" in today's critical climate.) I shall discuss some of these individually.

Iodine-131 is used to diagnose and treat thyroid disorders. My mother was one of the first to benefit from the use of this radioisotope. Fatally ill from hyperthyroidism (a related condition to that from which her sister died), diagnosis and treatment with iodine-131 led to her complete recovery and a long life-span (she died at the age of 81). Former President George Bush and First Lady Barbara Bush were both successfully treated for Graves' disease, a thyroid disease, with iodine-131. Radioactive iodine treatment is so successful that it has virtually replaced thyroid surgery.

Technetium-99m is the most widely used radioactive pharmaceutical for use in nuclear medicine. Different chemical forms are used for brain, bone, liver, spleen, and kidney imaging, and also for blood-flow studies. My wife, Helen, my daughter Dianne, and I myself have all benefited from diagnosis with technetium-99m. (We were accorded the peace of mind that comes with the determination of a clean bill of health.)

Cobalt-60 irradiation focuses directly on a cancer to destroy it, with little damage to surrounding tissue. Hundreds of thousands of Americans who suffer from cancer have been treated in this way. Today the use of cobalt-60 is shifting to another area. Every year millions of cubic meters of medical products and equipment are sterilized by irradiation worldwide.

Going beyond applications to nuclear medicine, I should like to say a word about the practical applications of some radioactive transuranium isotopes — plutonium-239, plutonium-238, americium-241, and californium-252.

In nuclear power reactors, some 40 percent of the energy produced in the course of a nuclear fuel cycle comes from plutonium-239. Since about 20 percent of the electricity generated in the United States comes from nuclear power plants, about twice as much electricity is generated from the synthetic element plutonium as is generated from oil-fired electrical generating plants.

One of the uses of plutonium-238 is in the Space Nuclear Auxiliary Power (SNAP) units that have been used to power satellites or, more important, to power remote sensing instruments. SNAP sources (fueled by plutonium-238) served as power sources for instrument packages on the five Apollo missions, the Viking unmanned Mars lander, and the Pioneer and Voyager probes to Jupiter, Saturn, Uranus, Neptune, and beyond.

Americium-241 is used in many smoke detectors for homes and businesses, in thickness gauges designed to measure and control sheet metal, foil, and plate-glass thickness during manufacturing processes, to measure levels of toxic lead in dried paint samples, and to help determine where oil wells should be drilled.

Californium-252 (a neutron emitter) is used for neutron activation analysis, to inspect airline luggage for hidden explosives, to gauge the moisture content of soil and other materials, in borehole logging in geology, and

***Radioisotopes** continued on page 62*

Glenn T. Seaborg is University Professor of Chemistry at the University of California at Berkeley and Associate Director-at-Large of the Lawrence Berkeley Laboratory. Cowinner of the 1951 Nobel Prize in Chemistry (with Edwin M. McMillan), Seaborg and his coworkers have discovered ten transuranium elements.

Air Force Report on the Roswell Incident

The adjacent "Memorandum for Correspondents" was issued by the Secretary of the Air Force September 8, 1994, accompanying a 23-page report of a 1994 U.S. Air Force investigation into the so-called Roswell incident, a claim of a crashed flying saucer in New Mexico in 1947. Following the memorandum we print a substantial portion of the Report of Air Force Research Regarding the "Roswell Incident," *including its Executive Summary, the key section, "What the Roswell Incident' Was," and the Conclusion. The report provides abundant evidence identifying the debris recovered on a New Mexico ranch as that from a balloon, a radar-tracking reflector, and an instrument package from "Project Mogul." Project Mogul was then a Top Secret field experiment being carried out at Alamogordo, New Mexico, by New York University scientists to study the possibility of detecting low-frequency pressure waves in the atmosphere from Soviet nuclear weapons tests.*

Memorandum for Correspondents
No. 255-M, Sept. 8, 1994

Secretary of the Air Force Sheila E. Widnall today announced the completion of an Air Force study to locate records that would explain an alleged 1947 UFO incident. Pro-UFO researchers claim an extraterrestrial spacecraft and its alien occupants were recovered near Roswell, N.M., in July 1947 and the fact was kept from the public.

At the request of Congressman Steven H. Schiff (R-NM), the General Accounting Office in February 1994 initiated an audit to locate all records related to the Roswell incident and to determine if such records were properly handled. The GAO audit entitled "Records Management Procedures Dealing With Weather Balloon, Unknown Aircraft, and Similar Crash Incidents" is not yet complete.

The GAO audit involved a number of government agencies but focused on the Air Force. In support of the GAO effort, the Air Force initiated a systematic search of current Air Force offices as well as numerous archives and records centers that might help explain the incident. Air Force officials also interviewed a number of persons who might have had knowledge of the events. Prior to the interviews Secretary Widnall released those persons from any previous security obligations that might have restricted their statements.

The Air Force research did not locate or develop any information that the "Roswell Incident" was a UFO event nor was there any indication of a "cover-up" by the Air Force. Information obtained through exhaustive records searches and interviews indicated the material recovered near Roswell was consistent with a balloon device of the type used in a then-classified project. No records indicated or even hinted at the recovery of "alien" bodies or extraterrestrial materials.

All documentation related to this case is now declassified and the information is in the public domain. All documentation has been turned over to the Air Force Historian. The Air Force report without attachments may be obtained by contacting Major Thurston, Air Force Public Affairs, (703) 695-0640. The report with all 33 attachments is available for review in the Pentagon Library in Room 1A518.

Report of Air Force Research Regarding the "Roswell Incident"

Executive Summary

The "Roswell Incident" refers to an event that supposedly happened in July, 1947, wherein the Army Air Forces (AAF) allegedly recovered remains of a crashed "flying disc" near Roswell, New Mexico. In February, 1994, the General Accounting Office (GAO), acting on the request of a New Mexico Congressman, initiated an audit to attempt to locate records of such an incident and to determine if records regarding it were properly handled. Although the GAO effort was to look at a number of government agencies, the apparent focus was on the Air Force. SAF/AAZ [Secretary of the Air Force/Security and Special Program Oversight], as the Central Point of Contact for the GAO in this matter, initiated a systematic search of current Air Force offices as well as numerous archives and records centers that might help explain this matter. Research revealed that the "Roswell Incident" was not even considered a UFO event until the 1978-1980 time frame. Prior to that, the incident was dismissed because the AAF originally identified the debris recovered as being that of a weather balloon. Subsequently, various authors wrote a number of books claiming that, not only was debris from an alien spacecraft recovered, but also the bodies of the craft's alien occupants. These claims continue to evolve today and the Air Force is now routinely accused of engaging in a "cover-up" of this supposed event.

The research located no records at existing Air Force offices that indicated any "cover-up" by the USAF or any indication of such a recovery. Consequently, efforts were intensified by Air Force researchers at numerous locations where records for the period in question were stored. The records reviewed did not reveal any increase in operations, security, or any other activity in July, 1947, that indicated any such unusual event may have occurred. Records were located and thoroughly explored concerning a then-TOP SECRET balloon project, designed to attempt to monitor Soviet nuclear tests, known as Project Mogul. Additionally, several surviving project personnel were located and interviewed, as was the only surviving person who recovered debris from the original Roswell site in 1947, and the former officer who initially identified the wreckage as a balloon. Comparison of all information developed or obtained indicated that the material recovered near Roswell was consistent with a balloon device and most likely from one of the Mogul balloons that had not been previously recovered. Air Force research efforts did not disclose any records of the recovery of any "alien" bodies or extraterrestrial materials.

Introduction

. . . Even though Air Force research originally started in January, 1994, the first official Air Force-wide tasking was directed by the March 1, 1994, memorandum from SAF/AA, (Atch 5), and was addressed to those current Air Staff elements that would be the likely repository for any records, particularly if there was anything of an extraordinary nature involved. This meant that the search was not limited to unclassified materials, but also would include records of the highest classification and compartmentation. . . .

What the Roswell Incident Was Not

Before discussing specific positive results that these efforts revealed, it is first appropriate to discuss those things, as indicated by information available to the Air Force, that the Roswell Incident" was not:

An Airplane Crash . . .

A Missile Crash . . .

A Nuclear Accident . . .

An Extraterrestrial Craft

The Air Force research found absolutely no indication that what happened near Roswell in 1947 involved any type of extraterrestrial spacecraft. This, of course, is the crux of this entire matter. "Pro-UFO" persons who obtain a copy of this response, at this point, most probably begin the "cover-up is still on" claims. Nevertheless, the research indicated absolutely no evidence *of any kind* that a spaceship crashed near Roswell or that any alien occupants were recovered therefrom, in some secret military operation or otherwise. This does not mean, however, that the early Air Force was not concerned about UFOs. However, in the early days, "UFO" meant Unidentified Flying Object, which literally translated as some object in the air that was not readily identifiable. It did not mean, as the term has evolved in today's language, to equate to alien spaceships. Records from the period reviewed by Air Force researchers as well as those cited by the authors mentioned before, do indicate that the USAF *was* seriously concerned about the inability to adequately identify unknown flying objects reported in American airspace. All the records, however, indicated that the focus of concern was not on aliens, hostile or otherwise, but on the Soviet Union. Many documents from that period

speak to the possibility of developmental secret Soviet aircraft overflying US airspace. This, of course, was of major concern to the fledgling USAF, whose job it was to protect these same skies.

The research revealed only one official AAF document that indicated that there was any activity of any type that pertained to UFOs and Roswell in July, 1947. This was a small section of the July Historical Report for the 509th Bomb Group and Roswell AAF that stated: "*The Office of Public Information* was quite busy during the month answering inquiries on the 'flying disc,' which was reported to be in possession of the 509th Bomb Group. The object turned out to be a radar tracking balloon" (included with Atch 11). Additionally, this history showed that the 509th Commander, Colonel Blanchard, went on leave on July 8, 1947, which would be a somewhat unusual maneuver for a person involved in the supposed first ever recovery of extraterrestrial materials. (Detractors claim Blanchard did this as a ploy to elude the press and go to the scene to direct the recovery operations.) The history and the morning reports also showed that the subsequent activities at Roswell during the month were mostly mundane and not indicative of any unusual high level activity, expenditure of manpower, resources, or security.

Likewise, the researchers found no indication of heightened activity anywhere else in the military hierarchy in the July, 1947, message traffic or orders (to include classified traffic). There were no indications and warnings, notice of alerts, or a higher tempo of operational activity reported that would be logically generated if an alien craft, whose intentions were unknown, entered US territory. . . .

What the "Roswell Incident" Was

As previously discussed, what was originally reported to have been recovered was a balloon of some sort, usually described as a "weather balloon," although the majority of the wreckage that was ultimately displayed by General Ramey and Major Marcel in the famous photos (Atch 16) in Ft. Worth, was that of a radar target normally suspended from balloons. This radar target, discussed in more detail later, was certainly consistent with the description of a July 9 newspaper article which discussed "tinfoil, paper, tape, and sticks." Additionally, the description of the "flying disc" was consistent with a document routinely used by most pro-UFO writers to indicate a conspiracy in progress—the telegram from the Dallas FBI office of July 8, 1947. This document quoted in part states: ". . . The disc is hexagonal in shape and was suspended from a balloon by a cable, which balloon was approximately twenty feet in diameter. . . . The object found resembles a high altitude weather balloon with a radar reflector. . . . Disc and balloon being transported. . . ."

Similarly, while conducting the popular literature review, one of the documents reviewed was a paper entitled "The Roswell Events," edited by Fred Whiting and sponsored by the Fund for UFO Research (FUFOR). Although it was not the original intention to comment on what commercial authors interpreted or claimed that other persons supposedly said, this particular document was different because it contained actual copies of apparently authentic sworn affidavits received from a number of persons who claimed to have some knowledge of the Roswell event. Although many of the persons who provided these affidavits to the FUFOR researchers also expressed opinions that they thought there was something extraterrestrial about this incident, a number of them actually described materials that sounded suspiciously like wreckage from balloons. These included the following:

Jesse A. Marcel, M.D. (son of the late Major Jesse Marcel; 11 years old at the time of the incident). Affidavit dated May 6, 1991. ". . . There were three categories of debris: a thick, foil-like metallic gray substance; a brittle, brownish-black plastic-like material, like Bakelite; and there were fragments of what appeared to be I-beams. On the inner surface of the I-beam, there appeared to be a type of writing. This writing was a purple-violet hue, and it had an embossed appearance. The figures were composed of curved, geometric shapes. It had no resemblance to Russian, Japanese, or any other foreign language. It resembled hieroglyphics, but it had no animal-like characters." . . .

Bessie Brazel Schreiber (daughter of W.W. Brazel; 14 years old at the time of the incident). Affidavit dated September 22, 1993. ". . . The debris looked like pieces of a large balloon which had burst. The pieces were small, the largest I remember measuring about the same as the diameter of a basketball. Most of it was a kind of double-sided material, foil-like on one side and rubber-like on the other. Both sides were grayish silver in color, the foil more silvery than the rubber. Sticks, like kite sticks, were attached to some of the pieces with a whitish tape. The tape was about two or three inches wide and had flowerlike designs on it. The 'flowers' were faint, a variety of pastel colors, and reminded me of Japanese paintings in which the flowers are not all connected. I do not recall any other types of material or markings, nor do I remember seeing gouges in the ground or any other signs that anything may have hit the ground hard. The foil-rubber material could not be torn like ordinary aluminum foil can be torn." . . .

In addition to those persons above still living who claim to have seen or examined the original material found on the Brazel Ranch, there is one additional person who was universally acknowledged to have been involved in its recovery, Sheridan Cavitt, Lt. Col., USAF (Ret). Cavitt is credited in all claims of having accompanied Major Marcel to the ranch to recover the debris, sometimes along with his Counter Intelligence Corps (CIC) subordinate, William Rickett, who, like Marcel, is deceased. Although there does not appear to be much dispute that Cavitt was involved in the materi-

al recovery, other claims about him prevail in the popular literature. He is sometimes portrayed as a closed-mouth (or sometimes even sinister) conspirator who was one of the early individuals who kept the "secret of Roswell" from getting out. Other things about him have been alleged, including the claim that he wrote a report of the incident at the time that has never surfaced.

Since Lt. Col. Cavitt, who had first-hand knowledge, was still alive, a decision was made to interview him and get a signed sworn statement from him about his version of the events. Prior to the interview, the Secretary of the Air Force provided him with a written authorization and waiver to discuss classified information with the interviewer and release him from any security oath he may have taken. Subsequently, Cavitt was interviewed on May 24, 1994, at his home. Cavitt provided a signed, sworn statement (Atch 17) of his recollections in this matter. He also consented to having the interview tape-recorded. A transcript of that recording is at Atch 18. In this interview, Cavitt related that he had been contacted on numerous occasions by UFO researchers and had willingly talked with many of them; however, he felt that he had oftentimes been misrepresented or had his comments taken out of context so that their true meaning was changed. He stated unequivocally, however, that the material he recovered consisted of a reflective sort of material like aluminum foil and some thin, bamboo-like sticks. He thought at the time, and continued to do so today, that what he found was a weather balloon and has told other private researchers that. He also remembered finding a small "black box" type of instrument, which he thought at the time was probably a radiosonde. Lt. Col. Cavitt also reviewed the famous Ramey/Marcel photographs (Atch 16) of the wreckage taken to Ft. Worth (often claimed by UFO researchers to have been switched and the remnants of a balloon substituted for it) and he identified the materials depicted in those photos as consistent with the materials that he recovered from the ranch. Lt. Col. Cavitt also stated that he had never taken any oath or signed any agreement not to talk about this incident and had never been threatened by anyone in the government because of it. He did not even know the "incident" was claimed to be anything unusual until he was interviewed in the early 1980's.

"Comparison of all information developed or obtained indicated that the material recovered near Roswell was consistent with a balloon device."

Similarly, Irving Newton, Major, USAF (Ret) was located and interviewed. Newton was a weather officer assigned to Fort Worth, who was on duty when the Roswell debris was sent there in July, 1947. He was told that he was to report to General Ramey's office to view the material. In a signed, sworn statement (Atch 30) Newton related that ". . . I walked into the General's office where this supposed flying saucer was lying all over the floor. As soon as I saw it, I giggled and asked if that was the flying saucer. . . . I told them that this was a balloon and a RAWIN target. . . ." Newton also stated that ". . . while I was examining the debris, Major Marcel was picking up pieces of the target sticks and trying to convince me that some notations on the sticks were alien writings. There were figures on the sticks, lavender or pink in color, appeared to be weather faded markings, with no rhyme or reason (sic). He did not convince me that these were alien writings." Newton concluded his statement by relating that ". . . during the ensuing years I have been interviewed by many authors, I have been quoted and misquoted. The facts remain as indicated above. I was not influenced during the original interview, nor today, to provide anything but what I know to be true, that is, the material I saw in General Ramey's office was the remains of a balloon and a RAWIN target."

Balloon Research

The original tasking from GAO noted that the search for information included "weather balloons." Comments about balloons and safety reports have already been made; however, the SAF/AAZ research efforts also focused on reviewing historical records involving balloons, since, among other reasons, that was what was officially claimed by the AAF to have been found and recovered in 1947.

As early as February 28, 1994, the AAZD research team found references to balloon tests taking place at Alamogordo AAF (now Holloman AFB) and White Sands during June and July 1947, testing "constant level balloons" and a New York University (NYU)/Watson Labs effort that used ". . . meteorological devices . . . suspected for detecting shock waves generated by Soviet nuclear explosions"—a possible indication of a cover story associated with the NYU balloon project. Subsequently, a 1946 HQ AMC memorandum was surfaced, describing the constant altitude balloon project, and specified that the scientific data be classified TOP SECRET Priority 1A. Its name was Project Mogul (Atch 19).

Project Mogul was a then-sensitive, classified project, whose purpose was to determine the state of Soviet nuclear weapons research. This was the early Cold War period and there was serious concern within the U.S. government about the Soviets developing a weaponized atomic device. Because the Soviet Union's borders were closed, the U.S. government sought to develop a long range nuclear explosion detection capability. Long range, balloon-borne, low frequency acoustic detection was posed to General Spaatz in 1945 by Dr. Maurice Ewing of Columbia University as a potential solution

(atmospheric ducting of low frequency pressure waves had been studied as early as 1900).

As part of the research into this matter, AAZD personnel located and obtained the original study papers and reports of the New York University project. Their efforts also revealed that some of the individuals involved in Project Mogul were still living. These persons included the NYU constant altitude balloon Director of Research, Dr. Athelstan F. Spilhaus; the Project Engineer, Professor Charles B. Moore; and the military Project Officer, Colonel Albert C. Trakowski.

All of these persons were subsequently interviewed and signed sworn statements about their activities. A copy of these statements are appended at Atch 20-22. Additionally, transcripts of the interview with Moore and Trakowski are also included (equipment malfunctioned during the interview of Spilhaus) (Atch 23-24). These interviews confirmed that Project Mogul was a compartmented, sensitive effort. The NYU group was responsible for developing constant level balloons and telemetering equipment that would remain at specified altitudes (within the acoustic duct) while a group from Columbia was to develop acoustic sensors. Doctor Spilhaus, Professor Moore, and certain others of the group were aware of the actual purpose of the project, but they did not know of the project nickname at the time. They handled casual inquiries and/or scientific inquiries/papers in terms of "unclassified meteorological or balloon research." Newly hired employees were not made aware that there was anything special or classified about their work; they were told only that their work dealt with meteorological equipment.

An advance ground team, led by Albert P. Crary, preceded the NYU group to Alamogordo AAF, New Mexico, setting up ground sensors and obtaining facilities for the NYU group. Upon their arrival, Professor Moore and his team experimented with various configurations of neoprene balloons; development of balloon "trains" (see illustration, Atch 25); automatic ballast systems; and use of Naval sonobuoys (as the Watson Lab acoustical sensors had not yet arrived). They also launched what they called "service flights." These "service flights" were not logged or fully accounted for in the published Technical Reports generated as a result of the contract between NYU and Watson Labs. According to Professor Moore, the "service flights" were composed of balloons, radar reflectors, and payloads specifically designed to test acoustic sensors (both early sonobuoys and the later Watson Labs devices). The "payload equipment" was expendable and some carried no "REWARD" or "RETURN TO . . ." tags because there was to be no association between these flights and the logged constant altitude flights which were fully acknowledged. The NYU balloon flights were listed sequentially in their reports (i.e., A, B, 1, 5, 6, 7, 8, 10 . . .) yet gaps existed for Flights 2-4 and Flight 9. The interview with Professor Moore indicated that these gaps were the unlogged "service flights."

Professor Moore, the on-scene Project Engineer, gave detailed information concerning his team's efforts. He recalled that radar targets were used for tracking balloons because they did not have all the necessary equipment when they first arrived in New Mexico. Some of the early developmental radar targets were manufactured by a toy or novelty company. These targets were made up of aluminum "foil" or foil-backed paper, balsa wood beams that were coated in an "Elmer's-type" glue to enhance their durability, acetate and/or cloth reinforcing tape, single strand and braided nylon twine, brass eyelets and swivels to form a multi-faced reflector somewhat similar in construction to a box kite (see photographs, Atch 26). Some of these targets were also assembled with purplish-pink tape with symbols on it (see drawing by Moore with Atch 21).

According to the log summary (Atch 27) of the NYU group, Flight A through Flight 7 (November 20, 1946 to July 2, 1947) were made with neoprene meteorological balloons (as opposed to the later flights made with polyethylene balloons). Professor Moore stated that the neoprene balloons were susceptible to degradation in the sunlight, turning from a milky white to a dark brown. He described finding remains of balloon trains with reflectors and payloads that had landed in the desert: the ruptured and shredded neoprene would "almost look like dark gray or black flakes or ashes after exposure to the sun for only a few days. The plasticizers and antioxidants in the neoprene would emit a peculiar acrid odor and the balloon material and radar target material would be scattered after returning to earth depending on the surface winds." Upon review of the local newspaper photographs from General Ramey's press conference in 1947 and descriptions in popular books by individuals who supposedly handled the debris recovered on the ranch, Professor Moore opined that the material was most likely the shredded remains of a multi-neoprene balloon train with multiple radar reflectors. The material and a "black box," described by Cavitt, was, in Moore's scientific opinion, most probably from Flight 4, a "service flight" that included a cylindrical metal sonobuoy and portions of a weather instrument housed in a box, which was unlike typical weather radiosondes which were made of cardboard. Additionally, a copy of a professional journal, maintained at the time by A.P. Crary, provided to the Air Force by his widow, showed that Flight 4 was launched on June 4, 1947, but was not

"Air Force research efforts did not disclose any records of the recovery of any 'alien' bodies or extraterrestrial materials."

LAW ENFORCEMENT CONFERENCE AT CARRIZOZO

On July 21, 1947 the Federal Bureau of Investigation is holding one of its series of conferences at Carrizozo in the District Court Room. Law enforcement officers of the Southwest are invited to attend. A profitable program has been outlined.

Alamogordo News

ABSORBED OTERO COUNTY ADVERTISER JAN. 1 1913. ABSORBED ALAMOGORDO CLOUDCROFTER AUG. 27, 1923

VOLUME 50, NUMBER 28 ALAMOGORDO, NEW MEXICO, THURSDAY, JULY 10, 1947 SUBSCRIPTION: $2.00 Per Year

FANTASY OF "FLYING DISC" IS EXPLAINED HERE

Above is a small section of the radar experimental equipment and personnel of the Watson Laboratories, AMC, which is attached to the White Sands Proving Ground Guided Missiles Project, tracing a "flying disc" or corner reflector as the arrow knows it in its flight by radar, photographing of the flight, charting and projecting upon a screen its progress. Arrow at the right shows the movie camera recording of the flight as detected by radar apparatus and arrow on left is pointing to a screen upon which seven seconds later the picture of the flight is shown. (Army Air Forces photo.)

Launching of the the corner reflector radar experimental device is about to take place in the above picture. This is undoubtedly the device reported far and wide as the "flying disc." It is, in the above picture as snapped by a member of the Alamogordo News staff, shown to be a two-balloon carried pair of commonly used radar reflector paper triangles covered with tinfoil and held rigidly by small wooden strips. Each of these corner reflectors is held to the cable and the two supporting balloons by twine. On the edges of the board frames of each "flying disc" is stapled a slip of typed paper bearing the words, "Property of Army Material Command Watson Laboratories, Army Air Field, Alamogordo New Mexico." (Alamogordo News photo.)

Above (reading left to right) Major C. W. Mangum, Lt. S. W. Seigel Major W. D. Pritchard, and Capt. L. B. Dysad, of Watson Laboratories Army Material Command long range radar detection project at the Army Air Base nine miles west of Alamogordo. These are the officers in charge at the station and Major Pritchard the one who invited members of the Alamogordo News staff to view the launching of a corner reflector Wednesday at 1 p. m. (Army Air Forces photo.)

Young Democratic Move Started In Otero County

Members of the executive committee and the central committee of the Otero County Democratic met at the courthouse Monday afternoon to organize a Young Democrats' Organization for Otero

Cloudcroft Host To Golf Tourney

Local talent at Cloudcroft will be out behind John Parker in the hope of defending their home course at the Lodge against all comers in the annual tournament which opens July 17.

Playing on the famous highest in the world golf course, the qualifiers will conclude play on Thurs-

News Men Watch Army Radar Crew Launch "Disc"

Local "flying discs", and possibly those throughout the nation, simmered down to balloon-piloted observation radar targets tossed from the Alamogordo Army Air Base and related hoax throughout the nation.

Those observed over Otero county were loosed from the north area of the local air base under the

he further explained the general use of the radar equipment at the base was tracking of rockets fired from the matter-base at the White Sands Proving Grounds.

Some of the balloons, of the type shown in the Alamogordo News representatives Wednesday, the commanding officer said, were used to carry at times devices that it

Seventy Youngsters Out For Classes

Seventy youngsters of Alamogordo responded to the call last night for swimming lessons this week to make this the most popular of summer recreational sports under the school-community center sponsored activities.

The softball league play continued hot and fast with the Lions trimming the Rotary Juniors 15 to 11 and the Alamo Beers dropping their game with the junior Men's Store nine 10 to 7. These 4 teams play every Monday night.

Another team-sports party will be held at the Alamogordo Community Center Friday evening with an orchestra lined up for the dancing.

Final activities of the Community Center program for this week will be the Center Talent on July 12. Saturday night with Manny Dallas orchestra furnishing the music.

Quimby Looks Over Workshop Systems To Get Start Here

Dr. Neal P. Quimby, superintendent of the New Mexico School for Blind, left Thursday for eastern points and this week is observing operations of a workshop for blind persons in Baltimore, Md. He will also visit Philadelphia, Pittsburgh and other cities making observations of workshops there.

Dr. Quimby is making his survey with the view of designing a workshop for blind to be built in Alamogordo. His observations will be used in making recommendations to architects in designing the building, and in setting up teaching methods and providing equipment for the workshop here.

The regents of the N. M. School for Blind have negotiated with A. G. and Fulton Holdsworth for five lots in Block 8, on Pennsylvania Ave. as a site for the workshop

This story in the July 10, 1947, *Alamogordo News* reported essentially what was being launched from Alamogordo Army Air Base—balloon-borne corner radar reflector experimental devices, one of which is very likely what rancher Brazel found. But the purpose of the launches and the name of the top-secret series of experiments, Project Mogul, were not disclosed until 1994.

recovered by the NYU group. It is very probable that this TOP SECRET project balloon train (Flight 4), made up of unclassified components, came to rest some miles northwest of Roswell, N.M., became shredded in the surface winds and was ultimately found by the rancher, Brazel, ten days later. This possibility was supported by the observations of Lt. Col. Cavitt (Atch 17-18), the only living eyewitness to the actual debris field and the material found. Lt. Col. Cavitt described a small area of debris which appeared "to resemble bamboo type square sticks one-quarter to one-half inch square, that were very light, as well as some sort of metallic reflecting material that was also very light . . . I remember recognizing this material as being consistent with a weather balloon."

Concerning the initial announcement, "RAAF Captures Flying Disc," research failed to locate any documented evidence as to why that statement was made. However, on July10, 1947, following the Ramey press conference, the *Alamogordo News* published an article with photographs demonstrating multiple balloons and targets at the same location as the NYU group operated from at Alamogordo AAF. Professor Moore expressed surprise at seeing this since his was the only balloon test group in the area. He stated, "It appears that there was some type of umbrella cover story to protect our work with Mogul." Although the Air Force did not find documented evidence that Gen. Ramey was directed to espouse a weather balloon in his press conference, he may have done so either because he was aware of Project Mogul and was trying to deflect interest from it or because he readily perceived the material to be a weather balloon based on the identification from his weather officer, Irving Newton. In either case, the materials recovered by the AAF in July, 1947, were not readily recognizable as anything special (only the purpose was special) and the recovered debris itself was unclassified. Additionally, the press dropped its interest in the matter as quickly as they had jumped on it. Hence, there would be no particular reason to further document what quickly became a "non-event."

The interview with Colonel Trakowski (Atch 23-24) also proved valuable information. Trakowski provided specific details on Project Mogul and described how the security for the program was set up, as he was formerly the TOP SECRET Control Officer for the program. He further related that many of the original radar targets that were produced around the end of

World War II were fabricated by toy or novelty companies using a purplish-pink tape with flower and heart symbols on it. Trakowski also recounted a conversation that he had had with his friend, and superior military officer in his chain of command, Colonel Marcus Duffy, in July, 1947. Duffy formerly had Trakowski's position on Mogul, but had subsequently been transferred to Wright Field. He stated: "Colonel Duffy called me on the telephone from Wright Field and gave me a story about a fellow that had come in from New Mexico, woke him up in the middle of the night or some such thing with a handful of debris, and wanted him, Colonel Duffy, to identify it. . . . He just said, 'It sure looks like some of the stuff you've been launching at Alamogordo' and he described it, and I said, 'Yes, I think it is.' Certainly Colonel Duffy knew enough about radar targets, radiosondes, balloon-borne weather devices. He was intimately familiar with all that apparatus."

Attempts were made to locate Colonel Duffy, but it was ascertained that he had died. His widow explained that, although he had amassed a large amount of personal papers relating to his Air Force activities, she had recently disposed of these items. Likewise, it was learned that A. P. Crary was also deceased; however his surviving spouse had a number of his papers from his balloon-testing days, including his professional journal from the period in question. She provided the Air Force researchers with this material. It is discussed in more detail within Atch 32. Overall, it helps fill in gaps of the Mogul story.

During the period the Air Force conducted this research, it was discovered that several others had also discovered the possibility that the "Roswell Incident" may have been generated by the recovery of a Project Mogul balloon device. These persons included Professor Charles B. Moore, Robert Todd, and coincidentally, Karl Pflock, a researcher who is married to a staffer who works for Congressman Schiff. Some of these persons provided suggestions as to where documentation might be located in various archives, histories, and libraries. A review of Freedom of Information Act (FOIA) requests revealed that Robert Todd, particularly, had become aware of Project Mogul several years ago and had doggedly obtained from the Air Force, through the FOIA, a large amount of material pertaining to it; long before the AAZD researchers independently seized on the same possibility.

Most interesting, as this report was being written, Pflock published his own report of this matter under the auspices of FUFOR, entitled "Roswell in Perspective" (1994). Pflock concluded from his research that the Brazel Ranch debris originally reported as a "flying disc" was probably debris from a Mogul balloon, [but that] there was a simultaneous incident that occurred not far away that caused an alien craft to crash and that the AAF subsequently recovered three alien bodies therefrom. Air Force research did not locate any information to corroborate that this incredible coincidence occurred, however.

In order to provide a more detailed discussion of the specifics of Project Mogul and how it appeared to be directly responsible for the "Roswell Incident," a SAF/AAZD researcher prepared a more detailed discussion on the balloon project which is appended to this report as Atch 32.

"It is very possible that this Top Secret project balloon train . . . came to rest some miles northwest of Roswell, N.M., . . . and was ultimately found by the rancher. . . ."

Other Research

In the attempt to develop additional information that could help explain this matter, a number of other steps were taken. First, assistance was requested from various museums and other archives (Atch 28) to obtain information and/or examples of the actual balloons and radar targets used in connection with Project Mogul and to correlate them with the various descriptions of wreckage and materials recovered. The blueprints for the "Pilot Balloon Target ML307C/AP Assembly" (generically, the radar target assembly) were located at the Army Signal Corps Museum at Fort Monmouth and obtained. A copy is appended as Atch 29. This blueprint provides the specification for the foil material, tape, wood, eyelets, and string used and the assembly instructions thereto. An actual device was also obtained for study with the assistance of Professor Moore. (The example actually procured was a 1953-manufactured model "C" as compared to the Model B which was in use in 1947. Professor Moore related that the differences were minor.) An examination of this device revealed it to be simply made of aluminum-colored foil-like material over a stronger paper-like material, attached to balsa wood sticks, affixed with tape, glue, and twine. When opened, the device appears as depicted in Atch 31 (contemporary photo) and Atch 25 (1947 photo, in a "balloon train"). When folded, the device is in a series of triangles, the largest being four feet by two feet ten inches. The smallest triangle section measures two feet by two feet ten inches. (Compare with descriptions provided by Lt. Col. Cavitt and others, as well as photos of wreckage.)

Additionally, the researchers obtained from the Archives of the University of Texas–Arlington (UTA) a set of original (i.e. first generation) prints of the photographs taken at the time by the *Fort Worth Star-Telegram*, that depicted Ramey and Marcel with the wreckage. A close review of these photos (and a set of first generation negatives also subsequently obtained

from UTA) revealed several interesting observations. First, although in some of the literature cited above, Marcel allegedly stated that he had his photo taken with the "real" UFO wreckage and then it was subsequently removed and the weather balloon wreckage substituted for it, a comparison shows that the same wreckage appeared in the photos of Marcel and Ramey. The photos also depicted that this material was lying on what appeared to be some sort of wrapping paper (consistent with affidavit excerpt of crew chief Porter, above). It was also noted that in the two photos of Ramey he had a piece of paper in his hand. In one, it was folded over so nothing could be seen. In the second, however, there appears to be text printed on the paper. In an attempt to read this text to determine if it could shed any further light on locating documents relating to this matter, the photo was sent to a national level organization for digitizing and subsequent photo interpretation and analysis. This organization was also asked to scrutinize the digitized photos for any indication of the flowered tape (or "hieroglyphics, depending on the point of view) that were reputed to be visible to some of the persons who observed the wreckage prior to its getting to Fort Worth. This organization reported on July 20, 1994, that even after digitizing, the photos were of *insufficient quality to visualize either* of the details sought for analysis. This organization was able to obtain measurements from the "sticks" visible in the debris after it was ascertained by an interview of the original photographer what kind of camera he used. The results of this process are provided in Atch 33, along with a reference diagram and the photo from which the measurements were made. All these measurements are compatible with the wooden materials used in the radar target previously described.

Conclusion

The Air Force research did not locate or develop any information that the "Roswell Incident" was a UFO event. All available official materials, although they do not directly address Roswell per se, indicate that the most likely source of the wreckage recovered from the Brazel Ranch was from one of the Project Mogul balloon trains. Although that project was TOP SECRET at the time, there was also no specific indication found to indicate that an official pre-planned cover story was in place to explain an event such as that which ultimately happened. It appears that the identification of the wreckage as being part of a weather balloon device, as reported in the newspapers at the time, was based on the fact that there was no physical difference in the radar targets and the neoprene balloons (other than the numbers and configuration) between Mogul balloons and normal weather balloons. Additionally, it seems that there was over-reaction by Colonel Blanchard and Major Marcel, in originally reporting that a "flying disc" had been recovered when, at that time, nobody for sure knew what that term even meant since it had only been in use for a couple of weeks.

Likewise, there was no indication in official records from the period that there was heightened military operational or security activity which should have been generated if this was, in fact, the first recovery of materials and/or persons from another world. The post-war U.S. military (or today's for that matter) did not have the capability to rapidly identify, recover, coordinate, cover-up, and quickly minimize public scrutiny of such an event. The claim that they did so without leaving even a little bit of a suspicious paper trail for 47 years is incredible.

It should also be noted here that there was little mentioned in this response about the recovery of the so-called "alien bodies." This is for several reasons: First, the recovered wreckage was from a Project Mogul balloon. There were no "alien" passengers therein. Secondly, the pro-UFO groups who espouse the alien bodies theories cannot even agree among themselves as to what, how many, and where, such bodies were supposedly recovered. Additionally, some of these claims have been shown to be hoaxes, even by other UFO researchers. Thirdly, when such claims are made, they are often attributed to people using pseudonyms or who otherwise do not want to be publicly identified, presumably so that some sort of retribution cannot be taken against them (notwithstanding that nobody has been shown to have died, disappeared or otherwise suffered at the hands of the government during the last 47 years). Fourth, many of the persons making the biggest claims of "alien bodies" make their living from the "Roswell Incident." While having a commercial interest in something does not automatically make it suspect, it does raise interesting questions related to authenticity. Such persons should be encouraged to present their evidence (not speculation) directly to the government and provide all pertinent details and evidence to support their claims if honest fact-finding is what is wanted. Lastly, persons who have come forward and provided their names and made claims, may have, in good faith but in the "fog of time," misinterpreted past events. The review of Air Force records did not locate even one piece of evidence to indicate that the Air Force has had any part in an "alien" body recovery operation or continuing cover-up.

During the course of this effort, *the Air Force has kept in close touch* with the GAO and responded to their various queries and requests for assistance. This report was generated as an official response to the GAO, and to document the considerable effort expended by the Air Force on their behalf. It is anticipated that that they will request a copy of this report to help formulate the formal report of their efforts. It is recommended that this document serve as the final Air Force report related to the Roswell matter, for the GAO, or any other inquiries.

RICHARD L. WEAVER
Col., USAF
Director, Security and Special
Program Oversight

There's a world of difference between wishful thinking and critical thinking.

Angels and auras ...
UFOs and unicorns ...
miracles and magic ...

These things may entertain us.
They may even speak to some of our deepest wishes.
But they don't really help us understand how the world works.

For that type of understanding, we need the tools of science and reason and critical thinking. That's where the SKEPTICAL INQUIRER comes in. Six times a year, *S.I.* brings you the best articles about critical investigations of paranormal and fringe-science claims. It also presents the latest reports on the state of science in our culture. Most of all, the SKEPTICAL INQUIRER demonstrates the need to question everything—and in so doing, proves again and again that the real world is far more exciting than anything the wishful thinkers can come up with.

You can help others learn more about how the world really works, instead of how some folks wish it worked:

- Ask your public library and/or your college or university library to subscribe to the SKEPTICAL INQUIRER.
- Or introduce your library to the SKEPTICAL INQUIRER with a gift subscription.
- Ask your bookstore to order the SKEPTICAL INQUIRER.
- And tell your friends what they're missing!

SKEPTICAL INQUIRER
THE MAGAZINE FOR SCIENCE AND REASON

THE COMMITTEE FOR THE SCIENTIFIC INVESTIGATION OF CLAIMS OF THE PARANORMAL
PO Box 703, Amherst NY, 14226-0703 • Phone (716) 636-1425

Arguing from a Vacuum

SCOTT O. LILIENFELD

House of Cards: Psychology and Psychotherapy Built on Myth. By Robyn M. Dawes. Free Press, New York, 1994. 338 pp. Hardcover, $22.95.

As psychologist Paul Meehl has pointed out, psychological researchers tend to be at a distinct disadvantage compared with researchers in the "hard" sciences, such as physics and chemistry. Psychological claims are usually more difficult to falsify than those in the hard sciences, largely because they are associated with a larger number of problematic auxiliary hypotheses (i.e., conjectures concerning such issues as the validity of the measures or the adequacy of the experimental procedures). Thus, unlike fallacious ideas in the hard sciences, which are generally "slain" by disconfirming data, erroneous psychological assertions often live on for decades. When negative findings arise, advocates of such claims can always point to flaws in the auxiliary hypotheses ("You used the wrong measure of intelligence"; "Your deception wasn't convincing enough"), thereby immunizing their pet ideas from falsification.

Blaming negative findings on auxiliary hypotheses cannot continue indefinitely, however; the proponents of questionable scientific claims must eventually either "put up or shut up." Otherwise, as the philosopher of science Imre Lakatos noted, these claims cross the murky but perilous line between science and pseudoscience. Pseudoscience results, according to Lakatos, when the advocates of an erroneous assertion blind themselves to the overwhelming tide of evidence against it.

It is these pseudoscientific elements of contemporary clinical psychology Robyn Dawes takes issue with in *House of Cards.* Dawes, himself a distinguished research psychologist, is no enemy to clinical psychology. To the contrary, in the early 1980s, Dawes was an instrumental player in a now-classic series of articles demonstrating the effectiveness of psychotherapy. But he maintains that many of the assertions taken for granted by most clinical psychologists are little more than pseudoscientific beliefs built upon an edifice of myth and misconception. Although Dawes takes aim at an enormous variety of issues, his prime targets are psychotherapy and clinical prediction.

With respect to psychotherapy, Dawes is the bearer of both good and bad news for practicing psychologists and psychiatrists. The good news, according to Dawes, is that psychotherapy works. With the aid of a statistical technique known as meta-analysis, which permits researchers to aggregate findings across a large number of studies, investigators have convincingly demonstrated that a wide variety of psychological interventions have positive, albeit often modest, effects on emotional adjustment. The bad news is that studies consistently indicate that the efficacy of treatment is essentially uncorrelated with therapist experience, whether measured in terms of the number of years of training or the possession of a license. Thus, there is no compelling evidence that clients need to pay high-priced professionals to enact psychological change; relatively straightforward behavioral interventions implemented by paraprofessionals will often suffice.

Dawes elegantly summarizes the outcome of the clinical vs. statistical prediction debate, which, although familiar to most researchers in clinical psychology, has had little discernible impact on clinical practice. Although most clinicians continue to rely upon "intuition" when combining multiple sources of data to make predictions (e.g., Will a recently released patient attempt suicide? Will a depressed client benefit from psychotherapy?), the psychological literature indicates that predictions based on simple statistical formulas almost always outperform (or at

worst perform as well as) those based on clinical judgment. And, as is the case with psychotherapy, there is precious little evidence that clinicians' ability increases with experience.

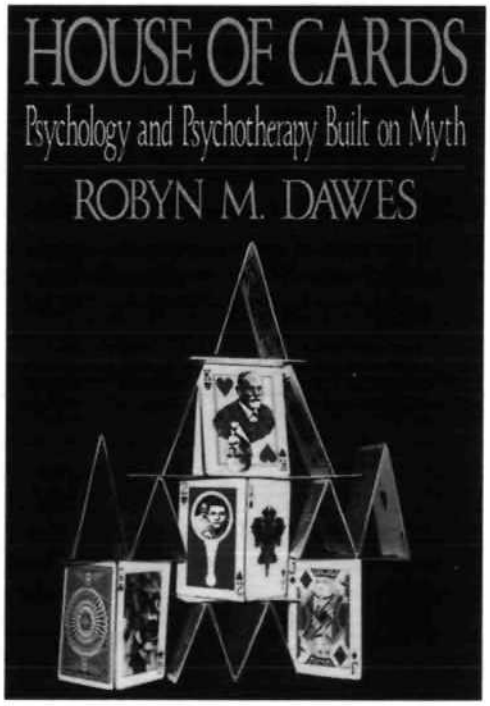
As Dawes notes, the clinical vs. statistical prediction debate conveys an important, although humbling, lesson. Clinical psychologists play a crucial and irreplaceable role in prediction, but this role consists of such activities as the construction of sophisticated measures and the thoughtful collection of data. Once the data are collected, prediction is best served if the clinician steps aside and leaves the rest of the work to the formula. Clinical psychologists are no different from the rest of us in having profound limitations as information processors, and they are far less efficient and accurate than formulas in combining and weighting information. In the book's most speculative but most intriguing chapter (Chapter 4), Dawes delineates a number of potential reasons why experience in psychotherapy and prediction often fosters the illusion of increased expertise. Among other things, clinicians tend to remember their "hits" (i.e., successful therapy cases and correct predictions) better than their "misses"; hits, after all, tend to be more interesting and more likely to be recounted to colleagues.

Dawes bemoans the failure of many psychotherapists to take heed of well-documented findings in basic psychology, such as those concerning memory processes. Most of the highly publicized claims concerning UFO abductions, for instance, ignore a substantial body of research demonstrating that memory is typically an active process of reconstruction, rather than a passive process of retrieval. Individuals can "remember" events that never occurred, because they piece together memories from such sources as preconceptions concerning these events, cues from therapists, and information from the media. This reconstructive process, says Dawes, also helps explain the massive recent upsurge in the prevalence of "recovered memories" of child abuse.

Although Dawes's tone at times verges on the polemical, his arguments are well reasoned and buttressed by an impressive body of research. In many respects, his book is both a plea and a manifesto for clear thinking in psychology. At the same time, he reaffirms the contribution of psychological research to identifying the limits of the clinician's curative powers and judgmental acumen. Dawes repeatedly decries what he terms "the argument from a vacuum," the ubiquitous claim that, had only the studies been conducted differently, more convincing evidence for the power of the clinician as healer, predictor, and so on, would surely have been found. Of course, arguing from a vacuum usually amounts to nothing more than blaming auxiliary hypotheses for repeated negative findings. Ultimately, Dawes's critics will have to provide affirmative evidence, rather than criticize in armchair fashion the multitude of studies yielding results not to their liking. No study is perfect but, as Dawes notes, this axiom fails to explain why essentially all of the findings point in the same direction.

After these laudatory remarks, a few criticisms are in order. Large sections of the book are poorly copy edited and riddled with an inordinate number of typographical and factual errors, some of them embarrassing (the medications used to treat schizophrenia are referred to as "narcoleptics" rather than "neuroleptics"; Hermann Rorschach, the developer of the famous inkblots, is said to have died in 1992 rather than 1922). At times, Dawes slips into black-and-white language, referring to measures like the Rorschach Test as "not valid," rather than pointing out that because validity is the extent to which inferences can be drawn from test scores, virtually all tests are valid for some purposes. The problem, of course, is that they may not be valid for the purposes intended by the test developer. Black-and-white language and thinking is already too common in popular psychology, and Dawes would have done better to steer clear of it.

"In many respects [this] book is both a plea and a manifesto for clear thinking in psychology."



By and large, however, these flaws pale in comparison to the book's accomplishments. Dawes has crafted an important work that should be mandatory reading for all serious students of psychology. If nothing else, *House of Cards* should serve as an impetus for those who doubt his conclusions to try to fill in the vacuum with facts. □

Scott O. Lilienfeld is a clinical psychologist and assistant professor in the Department of Psychology at Emory University in Atlanta, Georgia. He conducts research on psychological assessment and has performed psychotherapy.

Washed Up, Sold Out, and Spreading Hysteria

PETER HUSTON

Selling Satan: The Tragic History of Mike Warnke. By Mike Hertenstein and Jon Trott. Cornerstone Press, Chicago, Ill. 1993. 476 pp. Paper, $12.95.

If you would like to spread some hysteria, one method is to firmly convince members of a small subculture that something they strongly fear is actually happening.

If you choose a subculture that interacts with mainstream society, then the hysteria will often ultimately spread outside the bounds of its members. Members of the subculture will believe the story, and they in turn will tell others of their fear. People from outside this subculture who would not normally believe the story will note the sincerity and firm belief in the voices and mannerisms of their friends from within it and begin to reconsider their position. After all, those telling the tales have nothing to gain and are firm believers, so it must be true. Or so goes the logic.

In time, you will find many people, some with impressive credentials, believing the stories. They will be quoted and their credentials cited. Others will remain skeptical, but may begin to question whether their skepticism is appropriate. Ultimately, many of them will say, "With all of these stories, coming from all of these people, some of them must be true, even if many (or even most) are obviously absurd." After all (goes the logic), with all this smoke, there must be fire. Or, in the case of satanic-cult hysteria, "With all this horse manure piled so high and so deep, there must be a devilish little pony under there somewhere."

Born-again, evangelical, and fundamentalist Christians undoubtedly make up a subculture, by virtually any definition of the term. They have their own mass-market entertainment industry. They have "Christian" rock, "Christian" aerobics albums, "Christian" books on dinosaurs and evolution, and "Christian" comedians. They have schools and colleges with their own "Christian" curriculum that leaves out such facts as the widespread prevalence of other religions, the multicultural nature of the incredibly adaptive and flexible human race, evolution (human and otherwise), and the age of the universe. In short, many of them seek to live their lives so that they can minimize contact with all information sources that contradict their beliefs. If they do this successfully, then they can believe whatever they like and safely forget and ignore the troubling presence of not just secular humanists but also the mainstream churches of America and the world. On the other hand, most fundamentalist Christians do have regular jobs, shop at regular supermarkets, and live in normal neighborhoods, so they do interact with mainstream society on a fairly steady basis.

Within this evangelical subculture, Mike Warnke was a media superstar. Undoubtedly, part of his appeal was the way in which he proved to people that if they dedicated themselves to Jesus then they could have a good life, no matter how terrible they might have once been. As proof of this, Mike Warnke offered himself. He confessed to having been not only a drug addict but also a high priest of a satanic cult that practiced human sacrifice and ritualistic rape and child abuse. Warnke proudly stated that, through Jesus, he now had a blissful family life.

Warnke's alleged conversion from high satanic priest to dedicated Christian entertainer made a fascinating story and attracted considerable attention. Unlike Smith and Pazder's *Michelle Remembers,* an earlier, influential, allegedly autobiographical, staunchly pro-Catholic, satanic-cult-hysteria book, *The Satan Seller* appealed to the evangelical Protestant community.

In time, Warnke became known in some circles as an authority on satanic cults, and he appeared in that role on "20-20," "The Oprah Winfrey Show," "Larry King Live," "Focus on the Family," and "The 700 Club." He was cited as an authority on Satanism and living proof of the existence of cults engaging in satanic ritual abuse in such works as Friesen's *Uncovering the Mystery of MPD* [multiple personality disorder], Stratford's *Satan's Underground,* and Ryder's *Breaking the Circle of Satanic Ritual Abuse.* These in turn were cited in other works. Although it would be an exaggeration to say that Mike Warnke was solely responsible for the current spate of satanic-cult paranoia, he undoubtedly had a great influence. Few who have examined the arguments of believers in such cults can deny that many of them tend to have a worldview strongly grounded in Christian belief-systems and frequently a conservative fundamentalist orientation.

Warnke's book consists of his telling stories about the key events in his life and how they convinced him of the importance of adopting a Christian lifestyle. There were only two problems: He was a pretty lame and mediocre comedian, and he was corrupt and untruthful. In such a case, what is one to do? The answer is simple—call in Jon Trott and Mike Hertenstein, a pair of born-again Christian investigative journalists.

Hertenstein and Trott, working for *Cornerstone* magazine, an evangelical publication, conducted a thorough investigation into Warnke's claims. In *Selling Satan: The Tragic History of Mike Warnke,* they recount the investigation and the findings. Trott and Hertenstein tracked down and interviewed more than one hundred of Warnke's acquaintances from throughout his life. Among the discoveries was that Warnke's lies were not even very good ones. For example, by his own admission, he had been involved in drugs in college. He told how drug use led him on a self-destructive path culminating in involvement in the occult. This in turn led him to Satanism, and ultimately to becoming high priest of the group. Following the period of occult involvement, Warnke joined the Navy and served in Vietnam with the Marine Corp as a medical corpsman. While in the service he was converted and "saved" by two Christians who were sure that even Mike Warnke, former drug addict and satanic high priest, was not too far gone for Jesus' love to turn him around.

The writers uncovered that Warnke had entered college, a secular junior college, September 13, 1965. He entered the Navy on June 2, 1966. During his one semester prior to dropping out, there was hardly enough time for the many adventures Warnke claimed happened during his drug-addicted drug-dealer/Satanic-cultist-turned-high-priest period. These included being shot three times, riding a motorcycle to Mexico to make drug deals for a gangster, imprisoning sex slaves in his apartment, participating in CIA-funded LSD experiments at the college, and kidnapping a variety of victims for his cult's evil rituals and orchestrating the abduction of others. He described walking around campus dressed in black with pasty white skin, innumerable scabs on his face, waist-length hair, and six-inch-long fingernails, painted black and sharpened for fighting. As ludicrous as this thrill-a-minute college semester sounds, it became even more absurd as Trott and Hertenstein began pinning down the dates even further, based on Warnke's descriptions of various diabolic ceremonies held under the light of a full moon. The dates fell apart completely.

Fellow students and college faculty found further problems with the story. It was, after all, set in the early sixties, not the late sixties. There were no drugs at the junior college at the time, no CIA-funded LSD experiments, and no people with waist-length hair, much less the rest of the bizarre description Warnke provided. This pattern of gross falsehood continued. His period in Vietnam, described as a "year in Hell," was six months long, and most of his war stories had happened to other people or never occurred at all. Other stories could not be corroborated. For example, the two dedicated Christians who had "saved" Warnke had, he claimed, "died in Vietnam." His blissful family life following the war consisted of a series of four marriages, each ending in divorce, with much womanizing on the side. The donation plate passed around after each show supposedly went to a center for aiding satanic-cult-abuse victims. Neither the center nor the victims existed. And as for his Christianity, Trott and Hertenstein uncovered that, in a completely unexpected episode of bizarreness, Warnke had secretly been ordained as an independent bishop in an obscure Eastern Orthodox sect, which he practiced on the side. It should be mentioned that this version of Christianity would be quite distasteful to most of the people who purchased or enjoyed his materials.

"Trott and Hertenstein have made a valuable contribution to understanding the phenomenon of satanic-cult fears."

Warnke's lies remained undiscovered for many years for several reasons. First, he told people what they wanted to hear. Second, those who did uncover signs of corruption, either did not know where to go to inform his public or else did not wish to go public because of their personal financial interest or their approval of the way Warnke would successfully gain converts (to a religion he didn't practice).

I found *Selling Satan* fascinating. It is more than the story of one individual; it also deals with his effect on others. Warnke, evil as he is, is an intriguing character. Hertenstein and Trott also provide a very interesting picture of the "Christian" music industry. Their book should be read by all those concerned with satanic-cult hysteria. It is targeted for an audience that needs to hear this message and finds the writings of most skeptics distasteful, or even blasphemous.

As for the rest of us, *Cornerstone's* investigative pieces into such claims have been cited favorably by such authors as Robert Hicks and Jeffrey Victor, both of whom have contributed articles on this subject to the SKEPTICAL INQUIRER. Many skeptics often find such evangelical Christianity objectionable. Personally, I did not find this to be true as I read *Selling Satan.* In fact, it increased my respect for those who profess such beliefs. Trott and Hertenstein have made a valuable contribution to understanding the phenomenon of satanic-cult fears. I look forward to seeing the results of their next project. □

Peter Huston is a writer based in Schenectady, New York. His first book, Shattered Harmony, *a detailed study of Chinese gangs, secret societies, and underground religious cults, will be published by Paladin this year. He is also working on a book-length critique of the traditional arts and sciences of China.*

Mystical Quest Is Like A Pyramid Scheme

JOE SZIMHART

The Celestine Prophecy. By James Redfield. Warner Books, New York, 1993. 246 pp. $17.95.

Book covers can be interesting. On the front of this one is an endorsement by Elisabeth Kubler-Ross: "A fabulous book about experiencing life—I couldn't put it down." On the back we read: "You have never read a book like this before. . . . A book that comes along once in a lifetime to change lives forever." When James Redfield first published *The Celestine Prophecy,* before the bestselling Warner paperback edition, it had been a "word of mouth" sensation among New Age circles—the cover says it was read by more than 100,000 before Warner placed 670,000 in print in less than three months. Warner offered Redfield a deal that he did not refuse (an $800,000 advance, as reported in *New Age Journal,* August 1994, p. 127). In the early edition it was classified as a New Age book, according to the bookseller I bought my copy from. When the Warner edition came in, she said, it was reclassified as fiction. Having read the book, I think "New Age fiction" describes it well enough.

Recently when I was in New York I was directed to the New Age section of a large bookstore in Greenwich Village by the owner, who commented that this is the section where "the books take themselves seriously." I shared the humor. *The Celestine Prophecy* is a book that takes itself seriously.

Subtitled "An Adventure," it is a story in the genre of "true story" occult fiction made popular in the mid- to late-nineteenth century by Edward Bulwer-Lytton (*Zanoni; The Coming Race),* Marie Corelli (*A Romance of Two Worlds*), and a host of less popular writers. Bulwer-Lytton was a Rosicrucian sympathizer who expressed the "mysteries" of his sect in *Zanoni.* In that book the author purports to merely rewrite a manuscript that is mysteriously left in his office. Mysterious manuscripts have influenced popular imaginations to the extent that several new religions, cults, and belief systems have formed around such documents: the "golden plates" allegedly translated by Mormon founder Joseph Smith, the shadowy *Book of Dzyan* seen only by Theosophy's Madame H. P. Blavatsky and on which she based her Secret Doctrine, the bogus manuscript about the lost years of Jesus allegedly seen by Nicholas Notovitch in Ladakh, and so on, from the nineteenth century.

The cult of the mysterious manuscript and/or mystical autobiography carries over to the twentieth century in esoteric adventures by Baird T. Spaulding (*Life and Teaching of the Masters of the Far East*) and Guy "Godfre Ray King" Ballard (*Unveiled Mysteries*); in the missing Mexican tablets about the alleged lost civilization of Mu, by James Churchward; in Eugene E. Whitworth's *Nine Faces of Christ: Quest of the True Initiate;* and more recently in books by Carlos Castaneda and Lynn Andrews. *The Mayan Factor,* by Jose Arguelles, prophesied a planetary "harmonic convergence" in 1987 after loosely interpreting an ancient calendar.

Redfield takes up the theme of a mysterious "manuscript" as well as the mystical self quest. His book relates the secrets of life (ten "Insights") written in Aramaic around 600 B.C. but somehow found in Peru. This theme, more properly called a literary device, is used by writers with a deep need to get what they believe is a serious personal vision across to the public through the vehicle of a magical autobiographical experience. In his story, Redfield takes us on a journey of incredible coincidences as if he is guided by some unseen hand or telepathic force to meet the right people in his vague yearning to find the manuscript. He avoids getting shot, yet submits to arrest (only later to be released) while encountering sinister forces headed by a Cardinal Sabastian, who somehow controls the military and the manuscript. The evil cardinal is trying to wipe out all copies of the manuscript as well as all people with knowledge of the Insights. I was reminded of the movie *Close Encounters of the Third Kind* and Og Mandino's *The Greatest Salesman in the World,* underscored by J. R. R. Tolkien, with a bit of the latter's Golem character in Cardinal Sebastian.

Redfield unabashedly panders to the New Age beliefs of some of his admirers:

1. The ancient wisdom or truth has been occulted (hidden) because the established orthodoxy, jealous of its

power, does not want the masses to know the truth,

2. We are on the verge of a paradigm shift in human evolution. Does anyone remember the dawning of the Age of Aquarius in the late 1960s or the already-mentioned Harmonic Convergence in 1987? How about the "hundredth monkey" idea popularized by John Keyes, Jr. (and debunked in the SKEPTICAL INQUIRER, Summer 1985)?

3. When enough people get it, i.e., the Insights, the human race will hit the "critical mass" level, and we will all be enlightened. We will have peace on earth, the lion will lie down with the lamb, and we will walk in bodies of light. The Maharishi of Transcendental Meditation has been selling a path like this for decades.

4. The Christian church has been responsible for repressing the truth that in reality we are all "the Christ," that we are truly God if we could only transcend our ignorance, i.e., the "brainwashing" imposed upon us by the Church, the popular consensus, or even modern scientists, about our "reality."

5. When we awaken (raise our energy levels) to this inner reality, or gnosis, we will have magical powers like clairvoyance, healing, invisibility, and immortality. On page 174, Redfield as the narrator is experiencing the Seventh Insight, which amounts to being able to see colored auras of energy around creatures and objects. By the Ninth Insight, on page 242, we learn that invisibility can be attained: "'They can't see us!' Sanchez said. 'We are vibrating too highly!' "

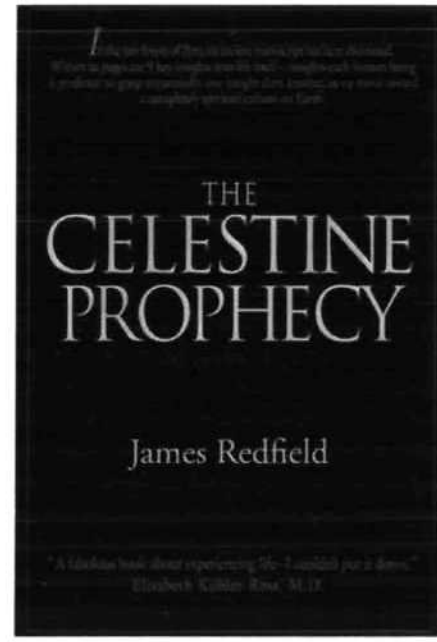
6. We are co-creators of the universe. We create our own reality.

7. If we get rid of "fear and doubt" we will maintain the "energy level" of our "higher self." The suggestion here is that anyone who might criticize the "teaching" (the "Celestine Prophecy" in this case) is merely expressing his or her fear and doubt. Therefore they will not gain the magical powers or "Insights," nor will they be saved. "All that any of us have to do is suspend our doubts and the distractions just long enough . . . and miraculously, this reality can be our own" (Redfield's note before page 1).

Joe Szimhart is a specialist in controversial new religions, therapies, and cults that use thought-reform techniques. He has worked internationally through consultation and intervention for more than a decade with many hundreds of victims of destructive cult activity.

"Redfield takes us on a journey of incredible coincidences as if he is guided by some unseen hand or telepathic force."

Redfield's book cover lied to me in several ways. I *have* read a book like this one. It is not a prophecy. It is a didactic regurgitation of simplistic occult notions that have been expressed by more or less talented writers and by fringe groups for more than a century. Redfield's style is cynical. He must take his audience for fools. His book, if nothing else, is like a transparent pyramid scheme, with him at the top of his "spiritual" franchise, that expects people to support whoever reveals the Ten Insights to them.



> "But what about the money?" I asked. "I can't believe people will voluntarily reduce their incomes."
>
> "Oh, we won't have to," Dobson said. "The Manuscript says our incomes will remain stable because of the people who are giving us money for the insights we provide." (p. 225)

Since Redfield is the only source of revelation:

> "I've been thinking," Fr. Carl continued, "that they're going to release you. You may be the only one who can look for it [Tenth Insight]." (p. 246)

Guess who gets most of the money? Guess who gets most of the adulation? If you think I am merely being cynical, read the promotion at the back of this book: $29.95 for the newsletter and $49.95 for an audiotape reading of your sun and moon sign by Redfield. So now we know that he is an astrologer. That explains a lot, to me at least, about his worldview and his milieu. Also, Redfield promises us a second book explaining the "Tenth Insight." Do we have a new guru with a new religious movement here?

The popularity of Redfield's book is not, therefore, surprising. Now and then books come out that appeal to a New Age or esoterically inclined audience that easily numbers in the tens of millions. Among them are the folks who read and believe books by Carlos Castaneda, Shirley MacLaine, and Lynn Andrews. Some have been influenced by reactionary revisions of the Jesus story and Christian orthodoxy in dictatorial tomes like *A Course in Miracles* and *The Urantia Book*. *A Celestine Prophecy* will go on my shelf among those just mentioned—but, alas, unlike *The Urantia Book*, it is not large enough to serve as a doorstop. □

New Books

Creationism's Upside-Down Pyramid. Lee Tiffin. Prometheus Books, Amherst, NY 14228-2197, 1994. 229 pp. $29.95, hardcover. The author, a plant biologist who has also been a pastor in numerous Christian churches, looks at what creationists believe and how they operate and introduces objective scientific information to show how their arguments fail.

Exploring the Physics of the Unknown Universe. Milo Wolff. Technotran Press, 1600 Nelson Avenue, Manhattan Beach, CA 90266, 1994. 251 pp. $39.00, hardcover. A different kind of science book. Explores the foundations of science but also divulges what scientists do not understand, the fascinating puzzles and challenges of physics. The style is an interaction between author and reader designed to stimulate interest in both science and the philosophy of science.

From *Skeptoons* by Harry Edwards

"You make the fake crop circle, and I'll make the real one."

Magic Minds, Miraculous Moments. Harry Edwards. Harry Edwards Publications, 3 Nullaburra Road, Newport NSW 2106, Australia, 1994. 240 pp. $15.95, plus $2.45 postage, paper. A biographical compendium of men and women who have had apparent psychic gifts and of the events of an alleged supernatural nature involving them. Following each entry the author makes a short comment and several suggestions for further reading that provide up-to-date critical perspectives.

Making Monsters. Richard Ofshe and Ethan Watters. Scribner's, New York, NY 10022, 1994. 340 pp. $22.00, paper. A major new work critically examining false memories, psychotherapy, and sexual hysteria. Pulitzer Prize-winning social psychologist Ofshe (University of California, Berkeley) and freelance writer Watters demonstrate that recovered memories can be false, fabricated in the highly charged atmosphere of therapy, usually through questionable techniques like hypnosis. The book is filled with case studies showing how pseudomemories have been created. Multiple-personality disorder is examined as a related fad and found to be a disorder created by therapists. The authors take poorly trained therapists to task and show how the mental-health establishment has actually contributed to the problem.

Roswell in Perspective. Karl T. Pflock. Fund for UFO Research Inc., P.O. Box 277, Mount Rainier, MD 20712, 1994. 189 pp. $25.00, plus $3.00 postage, paper. In many ways this monograph is an excellent and informed examination of the Roswell case. It came out two months before the September 1994 Air Force report that essentially explained the incident (see this issue, pp. 41-48), and it already included the basic information about Project Mogul that the Air Force report describes in greater detail. Nevertheless, Pflock's beliefs in the reality of crashed saucers sway him from accepting the natural conclusion of his own evidence.

Round in Circles. Jim Schnabel. Prometheus Books, Amherst, NY 14228-2197, 1994. 294 pp. $24.95, hardcover. Newly subtitled "Poltergeists, Pranksters, and the Secret of the Cropwatchers," this is the first U.S. edition of the book, published in London in 1993. Our reviewer (vol. 18, no. 2, Winter 1994) said the book "drives the final nail into the coffin of the crop-circle mystery."

Skeptoons. Harry Edwards. Harry Edwards Publications, 3 Nullaburra Road, Newport NSW 2106, Australia, 1994. 76 pp. $8.95, plus $1.20 postage, paper. An illustrated look at some New Age beliefs. Consists of short, very useful summaries of beliefs and claims and the critical evidence that exposes them. Each is accompanied by a witty cartoon.

—Kendrick Frazier

Articles of Note

Aguilar, Louis. "Dig (More) for Answers, Darnestown Builders Told." *Washington Post,* June 1, 1994, p. A9. How an archaeological dig in Montgomery County, Maryland, countered the findings of a psychic with a divining rod.

Becker, Howard S. "'Foi Por Acaso': Conceptualizing Coincidence." *Sociological Quarterly,* 35 (2): 183-194, May 1994. Sociologists seek causal relationships in other people's actions, but often attribute their own situations to chance. Becker doesn't deal directly with superstition, but does consider people's willingness or reluctance to accept hidden causes.

Capps, Lisa. "Change and Continuity in the Medical Culture of the Hmong in Kansas City." *Medical Anthropology Quarterly,* 8 (2): 161-177, June 1994. A study of the medical beliefs and practices used by Hmong refugees in Kansas City. These include a mixture of modern treatments with Chinese traditional medicine and shamanism.

Charfi, Farida Faouzia. "When Galileo Meets Allah." *New Perspective Quarterly,* 11 (2): 30-32, Spring 1994. Islamic fundamentalists are proud of Arabic contributions to science, but cling to a Ptolemaic view of the universe. They reject the rationalist views of Ibn Rochd (Averroes), a twelfth-century Islamic scholar who argued that the divine order can be studied scientifically.

Emery, C. Eugene, Jr. "Hoaxes Abound on the Shelves of Our Libraries." *Providence Journal,* Sunday Metropolitan Section, July 17, 1994. The problem of books that have been disclosed to be hoaxes still being listed in the nonfiction sections of libraries.

Feder, Kenneth L. Review of "Forbidden Archaeology: The Hidden History of the Human Race," by Michael A Cremo and Richard L. Thompson. *Geoarchaeology: An International Journal,* 9(4): 337-340, 1994. Anthropologist's critique of a 900-page work that mixes a literal interpretation of the Hindu myth of creation with human paleontology. The result is "antievolutionary Krishna creationism."

Hawass, Zahi, and Mark Lehner. "Remnant of a Lost Civilization?" *Archaeology,* September/October, 1994, pp. 14-17. Critique describes extensive flaws in a claim by West and Schoch that the Sphinx was built by a lost civilization between 5000 and 7000 B.C. rather than during the Old Kingdom (2575-2134 B.C.)

Kelly, I. W., and R. Martens. "Geophysical Variables and Behavior: LXXVIII. Lunar Phase and Birthdate: An Update." *Psychological Reports,* 75:507-511, 1994. Examination of six new studies on birthrate and lunar periodicities from five different countries. None produced evidence of lunar periodicities consistent with folklore.

King, J. R. "Scientific Status of Aromatherapy." *Perspectives in Science and Medicine,* 37 (3): 409-415, Spring 1994. King recognizes the unscientific nature and "new age" underpinnings of aromatherapy, but argues that the ability of smell to affect well-being is underestimated by mainstream science.

Kipp, Jacob W. "The Ukraine's Socio-Economic Crisis." *Military Review,* 74 (3): 32-37, March 1994. More than half of this article deals with the White Brotherhood, an apocalyptic group founded by Maria Devi Khristos, a Ukrainian journalist who claims to be God.

"Life in the Universe." *Scientific American,* October 1994. Special issue with ten articles on evolution of the universe, evolution of the Earth, the origin and evolution of life, the emergence of intelligence, the search for extraterrestrial intelligence, and sustaining life on Earth.

Marshall, Eliot. "The Politics of Alternative Medicine." *Science,* 265: 2000-2002, September 30, 1994. How the NIH Office of Alternative Medicine, established under pressure from Congress, has been thrown into chaos. Joseph Jacobs, its director, quit effective September 30, and in an interview with Marshall for this story blasts politicians and some advocates of alternative medicine for pressuring his office, promoting certain therapies, and attempting an end run around objective science.

Martin, Steven C. "'The Only Truly Scientific Method of Healing' Chiropractic and American Science, 1895-1990." *Isis,* 85 (2): 207-227, June 1994. The battle between chiropractic and mainstream medicine was in part an argument over what constitutes science in medicine. The observational (museum) view lost to the experimental (laboratory) view.

Maxwell, Joe. "End-time Prediction Draws Reaction." *Christianity Today,* 38 (7): 46-47, June 20, 1994. Harold Camping, owner of a Christian radio network, predicts the world will end in September 1994.

Millman, Joyce. "It's Not Prophetic, It's Pathetic." *San Francisco Examiner,*

April 10, 1994, pp. B10-B11. A blistering critique of doomsday forecasts for the end of the century in the two-hour NBC special "Ancient Prophecies." "The TV equivalent of the *Weekly World News*, 'Ancient Prophecies' gathers mystical hokum, unchallenged 'facts' and outright lies into one cheesy pseudo-documentary package."

Moon, Melissa M., and Edward J. Latessa. "Drug Treatment in Adult Probation: An Evaluation of an Outpatient and Acupuncture Program." *Evaluation and Program Planning,* 17(2):217-226, 1994. Study found no significant differences in arrests, convictions, and current status of a group of drug offenders who received acupuncture treatment, a placebo, or no treatment at all.

Nathan, Debbie. "Revisiting Country Walk." *Issues in Child Abuse Accusations,* 5(1): 1-11, Winter 1993. The Country Walk day-care case in Miami is often cited to support the reality of ritual abuse. Here an investigative journalist who has written frequently on this subject finds serious problems with the case.

O'Connor, John J. "TV's Infatuation with the Mystical." *New York Times,* June 30, 1994. "Take the supernatural and paranormal, sprinkle liberally with paranoia, and you have a substantial chunk of what increasingly seems to be television's entertainment agenda for the 1990s," says TV critic.

Reid, Calvin. "Publishers Protest After Park Service Shuts Down Book Display." *Publisher's Weekly,* 241 (32): 9, August 15, 1994. The Ellis Island Immigration Museum had a display on alternative medical traditions. After protests, the museum closed a room full of current books on alternative medicine, leading to more protests, this time from publishers.

Schnabel, Jim. "Band-Wagon Syndrome." *Washington Post,* June 29, 1994. Column about a "subversion of medical science by politics"—the attempt to create a "gulf war syndrome" and compensate victims of it. Points out that an official validation of a syndrome can lead to an epidemic of claims and relates the entire subject to incidents of mass hysteria.

Simpson, John. "The Sleep of Reason." *The Spectator,* 273 (8661): 11-14, July 9, 1994. Simpson fears that the Jupiter-comet collision will spark more unscientific thinking and end-of-the-world fantasies.

Taylor, Alan B. H. "An Episode with May-Dew." *History of Science,* 32(2): 163-184, June 1994. In 1664-1665 the Royal Society of London published their first experimental results. They "confirmed" the spontaneous generation of insects from the dew in May gardens.

Vonnegut, Bernard. "The Atmospheric Electricity Paradigm." *Bulletin of the American Meteorological Society,* 75(1): 53-61, January 1994. A noted atmospheric scientist contends that the paradigm about atmospheric electrification dominant for a hundred years—that it is a charge-separation process involving precipitation—may be wrong. He says it is time to take stock of the anomalies that have accumulated over the years (he lists 21) that may eventually lead to a change of the paradigm.

—Kendrick Frazier and Robert Lopresti

The Perfect Gift

SKEPTICAL INQUIRER
THE MAGAZINE FOR SCIENCE AND REASON

Save up to 34%!

Include my own subscription for:
☐ New ☐ Renewal
☐ 1 year ($29.50)
☐ 2 years ($49.00)
☐ 3 years ($69.00)
Charge my: ☐ Visa ☐ MasterCard
☐ Check enclosed ☐ Bill me
_____ Exp. _____
Total $ _____
(Outside the U.S., please pay in U.S. funds drawn on a U.S. bank. If you live outside North America add $8.00 a year.)

Order toll free: 1-800-634-1610
Or mail to: SKEPTICAL INQUIRER
Box 703 • Amherst, New York 14226-0703

1. $29.50 for first one-year gift subscription
Name (please print)
Address
City State Zip

2. $22.00 for second one-year gift subscription (*save 25%*)
Name (please print)
Address
City State Zip

3. $19.50 for third one-year gift subscription (*save 34%*)
Name (please print)
Address
City State Zip

A gift card will be sent in your name
Your name (please print)
Address City State Zip

A Letter to a Friend Who Thinks I'm Too Skeptical

RALPH ESTLING

Best wishes with the new computer and printer. No, I still do all my typing on an Olivetti portable that I bought secondhand in San Francisco in 1970. A few odd bits have fallen off over the years but it hasn't actually stopped working, so I'll go on using it a while longer.

I agree: a skeptical attitude can only be a negative thing. But I think it's vital, for all its negativity. Yes, we need new ideas, positive action, of course. But unless we view these skeptically, especially when they happen to be our own, and try to prove them wrong, in the fine old Popperian way, then whatever it is we're doing, it isn't scientific, the method is wrong, and so the results can't be trusted. Of course skepticism can be taken to silly or even insane extremes; but if we keep our wits about us, a skeptical attitude will be our best safeguard against bad ideas, our own and anybody else's. Yes, logical systems run into problems when forced to show their own logic to prove themselves in a self-referential way. This should have been obvious to logicians long before Gödel came up with his theorem. Nothing can prove itself; it always needs something else, something outside itself. Descartes knew this. He decided he needed to be aware of his thinking in order to prove that he existed. But logic—although it's imperfect—rationality, scientific deduction, all imperfect things, are the best things we have, imperfect though they undoubtedly are. I don't think that perfection is anything we should even bother about. You write that survival is the acid test, for ideas, for species, for everything. I'm not sure there is any acid test for anything. Even survival might be just a lucky accident proving nothing in itself except the laws of probability. A lot of very bad ideas still survive, to haunt and harry the human race. And a-priori reasoning, pure reason, as useful as it can be, is no substitute for careful observation. Maybe someday someone will write a critique of it.

I'm not sure what would happen if we followed your suggestion and interviewed a human spermatozoön about the purpose of its existence; but I'm of the opinion that if, as you say, we could somehow get an *Australopithecus afarensis* or *Homo habilis* to give us his (or her) outlook on things, he or she would take umbrage at any notion that the purpose of protohumans was, as you claim, to evolve into modern humans. I think all upstanding, self-respecting *Australopithecus* or *Homo habilis* would have objected to the idea that they were around for a few million years only so that they could eventually become us, that they served no purpose in being themselves. They might have objected to the whole concept of *purpose* or just argued that they were their own purpose.

We have to be very careful when we use the word *purpose*. The purpose of the human eye is to allow the human possessing it to see. But what is the purpose of that human? What is the purpose of the universe? What is it here for? What good does it do? What is it meant to achieve? The trouble with the word *purpose* is that it comes prepacked with all kinds of connotations, baggage, things hanging on it. Humans have purposes, but does human life? And if so, whose? The individual's? Society's? God's? The questions come easily, the answers not nearly so easily. I mean good answers. Bad answers come easily enough. Too many people are too sure about what life is *for*, what humans are *for*, what the universe is *for*. I'm not sure at all what all these are for. I'm not even sure that the question really has a meaning, except in the very narrow sense, like what is the purpose of an eye, a wing, a brain, where the answers are physiologic, not teleologic.

People confuse these two "purposes" and assume that because things have a physical purpose—a use, in other words—they must also have a spiritual "Purpose," a purpose not endowed by nature but by something else, or rather, Something Else, something beyond, above, beneath what we see, what we

experience. Something noumenal, possessed of Essence and Ultimate Reality, etc., etc. And of course this may be the case. But pure reasoning won't get *us* very far by itself. It's a good place to start off from, but if we want to get anywhere we eventually have to go beyond speculation and musing. There is always *plus ultra* when it comes to reality and it lies in the field of direct experience, empirical observation, getting the data, or as much of it as we can. Even the origin of the universe must be subject to experience and observation 15 billion (or whatever it is) years on.

You don't like reductionism, you say. Well, reductionism has a bad press among philosophers of science. It's become a kind of pejorative, the R word, a thing that expresses narrow, mechanical terms, and narrow, mechanical minds, lacking all those sublime Essences that Plato and his successors down the ages have so admired and admire to this day. I think reductionism, like skepticism, has its role to play, and it's a vital role. It may not be sufficient, but it is necessary. It keeps us from getting too grandiose. And anything that can do that is to be valued more than rubies. Reductionism compels us to look at and wonder about the little bits and pieces and not just the Big Picture. And if God is not in the details, still, an awful lot of important things are. Big Pictures are good things to think about and to travel toward, by way of all those little bits and pieces we call reductionism, so long as we have our faithful Indian companion, our kimo sabe, Skepticism, riding along at our side to make sure we don't stray from the path and into the dark wood.

So, while we must always inquire, we must always inquire skeptically, and our skepticism must, like charity, begin at home, with our own thoughts, our own conclusions, our own arguments that are meant to lead us and others to those conclusions. Which, it naturally follows, means that, as skeptical as you may be of all that I've just written here, I must be even more skeptical, more on my guard, because, after all, even more important than not fooling you is not fooling myself. The task is hard, and so I must give it all I have.

So in my skeptical way I'm not sure I can agree when you write: "Whatever drives human evolution holds dear the creative and imaginative faculties of the mind." I would like to agree, but I suspect that whatever it is that drives human evolution drives all evolution; and I suspect that this drive is the natural selection of individuals possessing random mutations that prove beneficial in the struggle for existence. This may certainly include the creative and imaginative faculties of the mind, but I wouldn't count on it. I think it might depend on what those creative and imaginative faculties actually come up with. If what is imagined and created by our minds turns out to be crap, then I'm very much of the opinion that human evolution will not be the better for it. You argue that our imagination and creativity must, on balance, be pretty good, this proved by the fact that we are still here. But the human race has only been around—what?—a few hundred thousand years, if we exclude those protohumans you mentioned and stick strictly to those paragons, the End Purpose, Us. It's a bit soon in the day to start congratulating ourselves on all our creative and imaginative faculties. The game has hardly begun. And, I can't help wondering, we may not have begun to realize its rules yet. If, as you say, the potential for spiritual experience was acquired through some mutation, it's still too early in the day to state with any degree of certainty that our possession of this potential is a good thing, survival-of-the-fittest-wise. We've just got here. The universe has been here for 15 billion years, maybe much longer. Earth has been here for 4.6 billion. Life for almost 4 billion. *We—a couple hundred thousand.* Nothing, not even an eyeblink, by comparison. We think we think and therefore we think this proves that we exist.

I think we have a lot to learn. And I've no idea how much time we'll have in which to learn it. Looking at things as objectively as I can (which is not all that objectively, I admit), I really wonder if we'll manage to do as well as the dinosaurs, which were around for about 140 million years, for all their shortcomings in the creative-and-imaginative-faculties department. Will we stick around for as long? For a tenth as long? For a hundredth? The situation, I can't help feeling, is in doubt.

You call the laws of evolution cruel. I don't think they're cruel, they are merely indifferent. But they are fixed and adamant and will not give us any breaks. That doesn't make them cruel, only fair. But then ideas like "cruelty" and "fairness" are human interlopings into the rules of the game, not part of the rules at all. You speak of "the way intended for us to go." I'll have to pass on that; there are just too many things to ask about that, too many steps needed to reduce that phrase into nitty-gritty meaningfulness.

You quote Bernard Shaw: "The reasonable man adapts himself to the world; the unreasonable one persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man." And you add: "Practically all unreasonable men perish in their attempts, but the few who succeed move the world; they make history." That is the end of your letter.

I think that Shaw, being an unreasonable man, was prejudiced in the matter of the worth of unreasonable men; but he may have had a point, although perhaps not the one he intended. Yes, it is often the case that it is the unreasonable among us who make history. Now, do something that Shaw never got around to doing: give history a good, hard look.

And then ask yourself would you like to make some. □

"I must be even more skeptical, more on my guard, because, after all, even more important than not fooling you is not fooling myself."

Ralph Estling writes from Ilminster, Somerset, England.

Kreskin *from page 21*

Sister Marie Gabriel took out ads in various British newspapers warning of dire consequences "like a cosmic day of judgment" from the collision of Jupiter and a comet she seems convinced is in fact Halley's. The list of celebrities who are supposed to be converted by her message begins with the Pope and the British Royal Family and moves downward from there.

Plus, the City Council of Green River, Wyoming, voted by a 5-2 margin that residents from the planet Jupiter fleeing that cosmic catastrophe would be welcome to come to Green River. Councilwoman Judy Aten voted against it, in part because the city does not have the permits necessary to allow the use of a local emergency aircraft landing field for interplanetary travelers. But the resolution carried, with the suggestion that NASA broadcast it to Jupiter. One resident suggests that Senator Alan Simpson (R-Wyoming) be contacted to expedite the sanctuary, in light of his recent admission to the *Weekly World News* that he was indeed a space alien.

And while few doubt the reality of the Jupiter-comet collision, in this twenty-fifth anniversary year of the landing of Apollo 11, there are still some 20 million Americans who are unconvinced that astronauts ever walked on the moon. A recent *Washington Post* poll surveyed 1,001 randomly selected Americans on this subject (July 20, 1994, p. B1). Nine percent of those surveyed agreed that it is "possible" that astronauts never made it to the moon, with another 5 percent not sure. The percentage of doubters is 20 percent among African-Americans. One of the factors encouraging doubters is the 1978 movie *Capricorn One*, frequently seen on TV, which depicts a space mission cleverly faked by NASA, along with a sinister and deadly cover-up. Charles Johnson, head of the Flat Earth Research Society, claims that one of the stars of that movie, O. J. Simpson, is now being framed for the murders of his ex-wife and her companion "because he helped unmask the space hoax." According to Johnson, "the entire government space program is a hoax." Not just the astronauts' exploits are bogus, but satellite launches as well, since there hasn't yet been any explanation of how satellites might circle a flat earth. □

Science *from page 38*

and guide our movements. This should allow us to understand "thinking" and other aspects of the "soul" in the metaphorical sense of the word. Will we then have solved the mystery of qualia—the redness of red?

The sensible answer is: Wait and see, till we fully understand the mechanisms involved. But we must concede that there *may* be aspects of seeing that, *for scientific reasons,* we cannot easily explain scientifically. In brief, we ought to be able to explain anything that we can communicate clearly, such as whether two very similar colors appear to us as different or exactly the same. But if there are aspects of what we see that are private (such as the redness of red)—so that we cannot communicate them unambiguously—then we may have difficulty in explaining them in detail. (Of course we shall also have to explain *why* they are so private.) We may have to accept such limitations, just as we have to accept the limitations to our knowledge of the world imposed on us by quantum mechanics. We can already give arguments, based on our present knowledge of neuroscience, that suggest such limitations, but it would be rash to try to reach positive conclusions in the absence of more detailed experimental evidence.

But, leaving these possible difficulties aside, there is no reason why we should not start the study of consciousness experimentally and press on relentlessly until we have uncovered all the intricate mechanisms involved. This will certainly take some time—probably well into the next century—but the sooner we start, the sooner we shall get there.

Such discoveries will almost certainly modify our view of ourselves, our beliefs, our customs, our legal system, to say nothing of our religious convictions; but in what way these will have to be modified, only time will tell. □

STATEMENT OF OWNERSHIP, MANAGEMENT, AND CIRCULATION (Required by 39 U.S.C. 3685)

Date of filing: September 29, 1994. Title: The Skeptical Inquirer. Frequency of issue: Quarterly. Complete mailing address of known office of publication: 3965 Rensch Road, PO Box 703, Buffalo, NY 14226. Publisher: CSICOP, Inc. (Committee for the Scientific Investigation of Claims of the Paranormal), 3965 Rensch Road, PO Box 703, Buffalo, NY 14226. Editor: Kendrick Frazier, 944 Deer Drive NE, Albuquerque, NM 87122. Managing Editor: Doris Doyle, PO Box 703, Buffalo, NY 14226. Owner: CSICOP, Inc. (Committee for the Scientific Investigation of Claims of the Paranormal), 3965 Rensch Road, PO Box 703, Buffalo, NY 14226. Known bondholders, mortgagees, and other security holders: None. Aver. no. copies during preceding 12 months: A. Total no. copies printed (net press run) 40,539. B. Paid and/or requested circulation (1) Sales through dealers and carriers, street vendors and counter sales 4,862 (2) Mail subscriptions 31,386. C. Total paid and/or requested circulation 36,248. D. Free distribution by mail carrier, or other means, samples, complimentary, and other free copies 2504. E. Free distribution outside mail (by carrier or other means) 47. F. Total free distribution (sum of D and E) 2,551. G. Total distribution (sum of C and F) 38,799. H. Copies not distributed (1) Office use, left over, spoiled 1,740; (2) return from news agents 0. I. Total (sum of G, H [1] and [2]) 40,539. Percent paid and/or requested circulation 94%. Actual no. copies of single issue published nearest filing date: A. Total no. copies printed (net press run) 40,000. B. Paid and/or requested circulation (1) Sales through dealers and carriers, street vendors and counter sales 5,439 (2) Mail subscriptions 31,174. C. Total paid and/or requested circulation 36,613. D. Free distribution by mail carrier, or other means, samples, complimentary, and other free copies 2,265. E. Free distribution outside mail (by carrier or other means) 45. F. Total free distribution (sum of D and E) 2,310. G. Total distribution (sum of C and F) 38,923. H. Copies not distributed (1) Office use, left over, spoiled 1,077; (2) return from news agents 0. I. Total (sum of G, H [1] and [2]) 40,000. Percent paid and/or requested circulation 94%.

Radioisotopes *from page 40*

in human cervix-cancer therapy.

The applications of radioisotopes in industry are numerous. Among these are: in manufacturing, for highly sensitive gauges to measure the thickness and density of numerous materials and to inspect finished goods for weakness and flaws; in the automobile industry, to test steel quality in the manufacture of cars and to obtain the proper thickness of tin and aluminum; in the aircraft industry, to check for flaws in jet engines; with construction crews, to gauge the density of road surfaces and subsurfaces; for pipeline companies, to test the strength of welds; for oil, gas, and mining companies, to map the contours of test wells and mine bores; and for cosmetic companies, to sterilize their products.

In addition, there are manifold uses in agriculture. In plant research, radiation is used to develop new plant types to speed up the process of developing superior agricultural products. Insect control is another important application; pest populations are drastically reduced and, in some cases, eliminated by exposing male insects to sterilizing doses of radiation. Fertilizer consumption is reduced through research with radioactive tracers. Radiation pellets are used in grain elevators to kill insects and rodents. Irradiation prolongs the shelf-life of foods by destroying bacteria, viruses, and molds.

The useful application of radioisotopes extends to the arts and humanities. Neutron activation analysis is extremely useful in identifying the chemical elements present in coins, pottery, and other artifacts from the past. A tiny unnoticeable fleck of paint from an art treasure or a microscopic grain of pottery suffices to reveal its chemical makeup. Thus the works of famous painters can be "fingerprinted" so as to detect the work of forgers. Many old photographs thought to be beyond saving have been restored to a remarkable degree through the application of the neutron activation process.

It is important to emphasize that there is in this country a growing tendency toward a hysterical reaction to anything labeled "radioactive." The Department of Energy hotline, established to gather information on possible victims of "radiation experiments," received a deluge of calls, many from citizens convinced they had been "poisoned" by beneficial, standard diagnostic and therapeutic nuclear medicine.

Radioisotopes have alleviated suffering and prolonged the lives of millions of human beings and contributed productively in many other ways. These beneficial contributions will continue and expand in the years ahead. □

Chairman *from page 4*

ria were sometimes so narrow as to limit the sample to a very small number of sports champions.

Since an impasse had been reached, it was proposed that an independent French Committee of skeptics (CFEPP) cooperate with Gauquelin to retest the French sample using the most rigorous criteria and assembling the data on their own. The protocol was published in *Science et Vie* in October 1982. There were numerous problems in developing the test, and it has taken 12 years to complete it. The Committee used a key sourcebook suggested by sports writers for determining the "famous" sports champions: *The Dictionary of Sports.* They added *L'athlège* upon the recommendation of Gauquelin. The announced results were negative, with 18.76 percent (200) of the 1,066 champions showing Mars in the first and fourth sectors, whereas a hypothetical population derived from a random redistribution of these champions shows 18.2 percent. The French Committee concluded that their efforts at independent replication *show no evidence for the Mars effect.*

When Gauquelin was asked to comment, at the end of the data-gathering phase, he wrote several letters in 1990 and 1991 to the Committee again disputing the sample. He proposed corrections of the data of 39 champions (increasing the number of athletes born in key sectors from 1 to 20 in this group); he offered the Committee 79 names of athletes whose data the Committee had unsuccessfully tried to find (32 of these were born with Mars in key sectors); he maintained that another 39 athletes satisfied the selection criteria but were nonetheless overlooked by the Committee. Of these 39, 23 were mentioned already in a 1955 publication by Gauquelin or were in the Para study, and 9 of these were in a key sector. He also requested that 16 names (none with Mars in key sectors) be deleted. The committee observed that by attempting to add or delete from the sample, Gauquelin was, in effect, biasing the results. Indeed, the committee concluded that the "Mars effect" *may be attributed primarily to Gauquelin's selective bias.*

Unfortunately, Michel Gauquelin committed suicide on May 20, 1991, with instructions, according to Suitbert Ertel, that all of his data be destroyed. It has been difficult to corroborate Ertel's claim. Ertel also asked the CFEPP to use his own "eminence" criteria to analyze the data; that is, to determine the fame of the athletes by reference to the number of citations they had in sports directories. But since this was not within the original published protocol, the French Committee decided not to do so. However, Jan Willem Nienhuys, a Dutch investigator who reviewed the *entire* French study, maintained at the Euroskeptics conference that Ertel's "eminence" criteria, which he analyzed, did *not* validate the Mars effect.

These and additional data are now being reviewed and are open to modification. The report of the French Committee comprises 110 pages. Prometheus Books will publish it as a monograph. (To order a copy of *The "Mars Effect": French Test of More Than 1,000 Sports Champions,* write to Prometheus Books, 59 John Glenn Drive, Amherst NY 14228-2917. The charge is $23.95, including postage and handling.) □

Fill in the gaps in your

SKEPTICAL INQUIRER

collection

15% discount on orders of $100 or more

($6.25 for each copy. To order, use reply card insert.)

FALL 1994 (vol. 18, no. 5): Empirical evidence for reincarnation? *Angel.* Reader's guide to the ozone controversy, *Dennett.* Why we are unmoved as oceans ebb and flow, *Quincey.* Anomalous phenomena in Kazakhstan, *Efimov.* False memories, *Gardner.*

SUMMER 1994 (vol 18, no 4.): 'Extraordinary science' and the strange legacy of Nikola Tesla, *Johnson.* Nikola Tesla: Genius, visionary, and eccentric, *Johnson.* Pollens on the 'Shroud': A study in deception, *Nickell.* Do televised depictions of paranormal events influence viewers' beliefs? *Sparks, Hansen,* and *Shah.* Synchronicity and the archetypes, *Gallo.* The synthetic mind clashes with the reductionist text, *Reuter.* Psi in pyschology, *Blackmore.*

SPRING 1994 (vol. 18, no. 3): The Antiscience Threat: The growth of antiscience, *Kurtz;* The antiscience problem, *Holton.* Measuring the prevalence of false memories, *Goertzel.* Bleuler's views on inheritance of acquired characteristics and on psi phenomena, *Windholz.* Examining the satanic panic: . . . A personal perspective, *Huston;* . . . A sociological and historical perspective, *Hines.* Philosophy and the paranormal, Part 2: Skepticism, miracles, and knowledge, *Grey.*

WINTER 1994 (vol. 18, no. 2) The new skepticism, *Kurtz.* Philosophy and the paranormal, Part 1: The problem of 'psi,' *Grey.* Electromagnetic field cancer scares, *Deutsch.* Attacks on role-playing games, *Cardwell.* Global fortune-telling and Bible prophecy, *Tremaine.* Chernikov pattern puzzle, *Pickover.*

FALL 1993 (vol. 18, no. 1): 'Perspectives on education in America': Sandia study challenges misconceptions, *Frazier.* Do 'honesty' tests really measure honesty? *Lilienfeld.* Astrology strikes back—but to what effect? *Dean.* Diagnoses of alien kidnappings that result from conjunction effects in memory, *Dawes and Mulford.* Mathematical magic for skeptics, *Benjamin and Shermer.* The blind girl who saw the flash of the first nuclear weapon test, *Sinelair.* Science: The feminists' scapegoat? *Walker.*

SUMMER 1993 (vol 17, no. 4): The right hemisphere: An esoteric closet? *Saravi.* Improving science teaching: The textbook problem, *Padian.* The eyewitness: Imperfect interface between stimuli and story, *Reich.* Pathological science: An update, *Cromer.* Jack Horkheimer, 'Star Hustler,' interview *by Gabriel Seabrook.* The false memory syndrome, *Gardner.*

SPRING 1993 (vol 17, no. 3): Anguished silence and helping hands: Autism and Facilitated Communication, *Mulik, Jacobson, and Kobe.* Faciliated Communication, autism, and Ouija, *Dillon.* Treading on the edge: Practicing safe science with SETI, *Tarter.* Education for science, *Gore.* A threat to science, *Schatzman.* Charles Honorton's legacy to parapsychology, *Blackmore.* 1993 CSICOP Conference.

WINTER 1993 (vol 17, no. 2): Special report: 3.7 million Americans kidnapped by aliens? *Stires and Klass.* Psychics: Do police departments really use them? *Sweat* and *Durm.* Psychic detectives: A critical examination, *Walter Rowe.* Therapeutic Touch, *Bullough and Bullough.* Improving science teaching in the U.S., *Marek and Rowe.* The Big Sur 'UFO,' *George.* The strange case of the New Haven oysters, *Quincey.*

FALL 1992 (vol 17, no 1): A celebration of Isaac Asimov: A man for the universe, *Kendrick Frazier, Arthur C. Clarke. Frederik Pohl, Harlan Ellison, L. Sprague de Camp, Carl Sagan, Stephen Jay Gould, Martin Gardner, Paul Kurtz, Donald Goldsmith, James Randi, and E. C. Krupp.* Gaia without mysticism, *Shannon.* Gaia's scientific coming of age, *Frazier.* The curse of the runestone: Deathless hoaxes, *Whittaker.* Night terrors, sleep paralysis, and devil-stricken telephone cords from hell, *Huston.* Scientific creationism: The social agenda of a pseudoscience, *Shore.* Observing stars in the daytime: The chimney myth, *Sanderson.* Does an ancient Jewish amulet commemorate the conjunction of 2 B.C.? *Rubincam.*

SUMMER 1992 (vol. 16, no. 4): Freedom of scientific inquiry under siege, *Kurtz.* Psychic experiences: Psychic illusions, *Blackmore.* The scientist's skepticism, *Bunge.* The persistent popularity of the paranormal, *Lett.* Self-help books: Pseudoscience in the guise of science? *Gambrill.*

SPRING 1992 (vol. 16, no. 3): Special Report: The Maharishi caper: *JAMA* hoodwinked, *Skolnick.* Myths of subliminal persuasion: The cargo-cult science of subliminal persuasion, *Pratkanis;* Subliminal perception: Facts and fallacies, *Moore;* Subliminal tapes, *Phelps* and *Exum.* The Avro VZ-9 'flying saucer,' *Blake.* Two 19th-century skeptics: Augustus de Morgan and John Fiske, *Rothman.*

WINTER 1992 (vol.16, no.2): On being sued: The chilliing of freedom of expression, *Kurtz.* The crop-circle phenomenon, *Nickell and Fischer.* Update on the 'Mars effect,' *Ertel.* A dissenting note on Ertel's 'Update,' *Kurtz.* Magic Melanin: Spreading scientific illiteracy among minorities, Part 2, *de Montellano.* Adventures in science and cyclosophy, *de Jager.* Searching for security in the mystical, *Grimmer.*

FALL 1991 (vol. 16, no. 1): Near-death experiences, *Blackmore.* Multicultural pseudoscience: Spreading scientific illiteracy, Part 1, *de Montellano.* Science and commonsense skepticism, *Aach.* Spook Hill, *Wilder.* Lucian and Alexander, *Rowe.* 1991 CSICOP conference, *Shore* and *Frazier.*

SUMMER 1991 (vol. 15, no. 4): Lucid dreams, *Blackmore.* Nature faking in the humanities, *Gallo.* Carrying the war into the never-never land of psi: Part 2, *Gill.* Coincidences, *Paulos.* Locating invisible buildings, *Plummer.* True believers, *Bower.*

SPRING 1991 (vol. 15, no. 3): Special report: Hi-fi pseudoscience, *Davis.* Searching for extraterrestrial intelligence: An interview with *Thomas R. McDonough.* Getting smart about getting smarts, *Faulkes.* Carrying the war into the never-never land of psi: Part 1, *Gill.* Satanic cult 'survivor' stories, *Victor.* 'Old-solved mysteries': The Kecksburg incident, *Young.* Magic, medicine, and metaphysics in Nigeria, *Roder.* What's wrong with science education? Look at the family, *Eve.*

WINTER 1991 (vol. 15, no. 2): Special report/ Gallup poll: Belief in paranormal phenomena, *Gallup and Newport.* Science and self-government, *Piel.* West Bank collective hysteria episode, *Stewart.* Acceptance of personality test results, *Thiriart.* Belief in astrology: A test of the Barnum effect, *French, Fowler, McCarthy,* and *Peers.* A test of clairvoyance using signal-detection, *McKelvie* and *Gagne.* Intercessory prayer as medical treatment? *Wittmer* and *Zimmerman.*

FALL 1990 (vol. 15, no. 1): Neural Organization Technique: Treatment or torture, *Worrall.* The spooks of quantum mechanics, *Stenger.* Science and Sir William Crookes, *Hoffmaster.* The 'N' machine, *Cumming.* Biological cycles and rhythms vs. biorhythms, *Wheeler.* 1990 CSICOP Conference.

SUMMER 1990 (vol. 14, no. 4): Ghosts make news: How four newspapers report psychic phenomena, *Klare.* Thinking critically and creatively, *Wade* and *Tavris.* Police pursuit of satanic crime, Part *2, Hicks.* Order out of chaos in survival research, *Berger.* Piltdown, paradigms, and the paranormal, *Feder.* Auras: Searching for the light, *Loftin.*

SPRING 1990 (vol.14, no.3): Why we need to understand science, *Sagan.* The crisis in pre-college science and math education, *Seaborg.* Police pursuit of satanic crime, Part *1, Hicks.* The spread of satanic-cult rumors, *Victor.* Lying about polygraph tests, *Shneour.* Worldwide disasters and moon phase, *Kelly, Saklofske, and Culver.*

WINTER 1990 (vol. 14, no. 2): The new catastrophism, *Morrison* and *Chapman.* A field guide to critical thinking, *Lett.* Cold fusion: A case history in 'wishful science'? *Rothman.* The airship hysteria of 1896-97, *Bartholomew.* Newspaper editors and the creation-evolution controversy, *Zimmerman.* Special report: New evidence of MJ-12 hoax, *Klass.*

FALL 1989 (vol. 14, no. 1): Myths about science, *Rothman.* The relativity of wrong, *Asimov.* Richard Feynman on fringe science; Luis Alvarez and the explorer's quest, *Muller.* The two cultures, *Jones.* The 'top-secret UFO papers' NASA *won't* release, *Klass.* The metaphysics of Murphy's Law, *Price.*

SUMMER 1989 (vol. 13, no. 4): The New Age—An examination: The New Age in perspective, *Kurtz.* A New Age reflection in the magic mirror of science, *O'Hara.* The New Age: The need for myth in an age of science, *Schultz.* Channeling, *Alcock.* The psychology of channeling, *Reed,* 'Entities' in the linguistic minefield, *Thomason.* Crystals, *Lawrence.* Consumer culture and the New Age, *Rosen.* The Shirley MacLaine phenomenon, *Gordon.* Special report: California court jails psychic surgeon, *Brenneman.*

SPRING 1989 (vol. 13, no. 3): High school biology teachers and pseudoscientific belief, *Eve* and *Dunn.* Evidence for Bigfoot? *Dennett.* Alleged pore structure in Sasquatch footprints, *Freeland* and *Rowe.* The lore of levitation, *Stein.* Levitation 'miracles' in India, *Premanand.* Science, pseudoscience, and the cloth of Turin, *Nickell.* Rather than just debunking, encourage people to think, *Seckel.* MJ-12 papers 'authenticated'? *Klass.* A patently false patent myth, *Sass.*

WINTER 1989 (vol. 13, no. 2): Special report: The 'remembering water' controversy, *Gardner* and *Randi;* Bibliographic guide to the 'dilution controversy.' Pathologies of science, precognition, and modern psychophysics, *Jensen.* A reaction-time test of ESP and precognition, *Hines* and *Dennison.* Chinese psychic's pillbottle demonstration, *Wu Xiaoping.* The Kirlian technique, *Watkins* and *Bickel.* Certainty and proof in creationist thought, *Leferriere.*

FALL 1988 (vol. 13, no. 1): Special report: Astrology and the presidency, *Kurtz* and *Bob.* Improving Human Performance: What about parapsychology? *Frazier.* The China syndrome: Further reflections on the paranormal in China, *Kurtz.* Backward masking, *McIver.* The validity of graphological analysis, *Furnham.* The intellectual revolt against science, *Grove.*

SUMMER 1988 (vol. 12, no. 4): Testing psi claims in China, *Kurtz, Alcock, Frazier, Karr, Klass,* and *Randi.* The appeal of the occult: Some thoughts on history, religion, and science, *Stevens.* Hypnosis and reincarnation, *Venn.* Pitfalls of perception, *Wheeler.* Wegener and pseudoscience: Some misconceptions, *Edelman.* An investigation of psychic crime-busting, *Emery.* High-flying health quackery, *Hines.* The bar-code beast, *Keith.*

SPRING 1988 (vol. 12, no. 3): Neuropathology and the legacy of spiritual possession, *Beyerstein.* Varieties of alien experience, *Ellis.* Alien-abduction claims and standards of inquiry (excerpts from Milton Rosenberg's radio talkshow with guests Charles Gruder, Martin Orne, and Budd

(Continued on the next page)

Hopkins). The MJ-12 Papers: Part 2, *Klass.* Doomsday: The May 2000 prediction, *Meeus.* My visit to the Nevada Clinic, *Barrett.* Morphic resonance in silicon chips, *Varela* and *Letelier.* Abigail's anomalous apparition, *Durm.* The riddle of the Colorado ghost lights, *Bunch* and *White.*

WINTER 1987-88 (vol.12, no.2): The MJ-12 papers: Part I, *Philip J. Klass.* The aliens among us: Hypnotic regression revisited, *Baker.* The brain and consciousness: Implications for psi, *Beyerstein.* Past-life hypnotic regression, *Spanos.* Fantasizing under hypnosis, *Reveen.* The verdict on creationism, *Gould.*

FALL 1987 (vol. 12, no. 1): The burden of skepticism, *Sagan.* Is there intelligent life on Earth? *Kurtz.* Medical Controversies: Chiropractic, *Jarvis;* Homeopathy, *Barrett;* Alternative therapies, *Jones;* Quackery, *Pepper.* Catching Geller in the act, *Emery.* Special Report: CSICOP's 1987 conference.

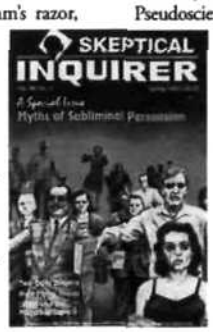
SUMMER 1987 (vol. 11, no. 4): Incredible cremations: Investigating combustion deaths, *Nickell and Fischer.* Subliminal deception, *Creed.* Past tongues remembered? *Thomason. Is* the universe improbable? *Shotwell.* Psychics, computers, and psychic computers, *Easton.* Pseudoscience and children's fantasies, *Evans.* Thoughts on science and superstrings, *Gardner.* Special Reports: JAL pilot's UFO report, *Klass;* Unmasking psychic Jason Michaels, *Busch.*

SPRING 1987 (vol. 11, no. 3): The elusive open mind: Ten years of negative research in parapsychology, *Blackmore.* Does astrology need to be true? Part 2: The answer is no, *Dean.* Magic, science, and metascience: Some notes on perception, *D. Sagan.* Velikovsky's interpretation of the evidence offered by China, *Lo.*

WINTER 1986-87 (vol. 11, no. 2): Case study of West Pittston 'haunted' house, *Kurtz.* Science, creationism and the Supreme Court, *Seckel,* with statements by *Ayala, Gould,* and *Gell-Mann.* The great East Coast UFO of August 1986, *Oberg.* Does astrology need to be true? Part 1, *Dean.* Homing abilities of bees, cats, and people, *Randi.*

FALL 1986 (vol.11, no.1): The path ahead: Opportunities, challenges, and an expanded view, *Frazier.* Exposing the faith-healers, *Steiner.* Was Antarctica mapped by the ancients? *Jolly.* Folk remedies and human belief-systems, *Reuter.* Dentistry and pseudoscience, *Dodes.* Atmospheric electricity, ions, and pseudoscience, *Dolezalek.* Noah's ark and ancient astronauts, *Harrold and Eve.* The Woodbridge UFO incident, *Ridpath.* How to bust a ghost, *Baker.*

SUMMER 1986 (vol.10, no. 4): Occam's razor, *Shneour.* Clever Hans redivivus, *Sebeok.* Parapsychology miracles, and repeatability, *Flew.* The Condon UFO study, *Klass.* Four decades of fringe literature, *Dutch.* Some remoteviewing recollections, *Weinberg.*



SPRING 1986 (vol. 10, no. 3): The perennial fringe, *Asimov.* The uses of credulity, *de Camp.* Night walkers and mystery mongers, *Sagan.* CSICOP after ten years, *Kurtz.* Crash of the crashed-saucers claim, *Klass.* A study of the Kirlian effect, *Watkins and Bickel.* Ancient tales and spaceage myths of creationist evangelism, *McIver.*

WINTER 1985-86 (vol. 10, no. 2): The moon was full and nothing happened, *Kelly, Rotton,* and *Culver.* Psychic studies: The Soviet dilemma, *Ebon.* The psychopathology of fringe medicine, *Sabbagh.* Computers and rational thought, *Spangenburg and Moser.*

FALL 1985 (vol.10, no. 1): Investigations of firewalking, *Leikind and McCarthy.* Firewalking: Reality or illusion, *Dennett.* Myth of alpha consciousness, *Beyerstein.* Spiritrapping unmasked, V. *Bullough.* The Saguaro incident, *Taylor and Dennett.*

SUMMER 1985 (vol.9, no 4.): Guardian astrology study, *Dean, Kelly, Rotton,* and *Saklofske.* Astrology and the commodity market, *Rotton.* The hundreth monkey phenomenon, *Amundson.* Responsibilites of the media, *Kurtz.* 'Lucy' out of context, *Albert.*

SPRING 1985 (vol. 9, no. 3): Columbus poltergeist: I, *Randi.* Moon and murder in Cleveland, *Sanduleak.* Image of Guadalupe, *Nickell* and *Fischer.* Radar UFOs, *Klass.* Phrenology, *McCoy.* Deception by patients, *Pankratz.* Communication in nature, *Orstan.*

WINTER 1984-85 (vol.9, no.2): The muddled 'Mind Race,' *Hyman.* Searches for the Loch Ness monster, *Razdan* and *Kielar.* Final interview with Milbourne Christopher, *Dennett.* Retest of astrologer John McCall, *Ianna* and *Tolbert.*

FALL 1984 (vol. 9, no. 1): Quantum theory and the paranormal, *Shore.* What is pseudoscience? *Bunge.* The new philosophy of science and the 'paranormal,' *Toulmin.* An eye-opening double encounter, *Martin.* Similarities between identical twins and between unrelated people, *Wyatt et al.* Effectiveness of a reading program on paranormal belief, *Woods,* Pseudoscientific beliefs of 6th graders, *A. S.* and *S. I. Adelman.*

SUMMER 1984 (vol. 8, no. 4): Parapsychology's past eight years, *Alcock.* The evidence for ESP, *C. E. M. Hansel.* $110,000 dowsing challenge, *Randi.* Sir Oliver Lodge and the spiritualists, *Hoffmaster.* Misperception, folk belief, and the occult, *Connor.* Psychology and UFOs, *Simon.*

SPRING 1984 (vol. 8, no. 3): Belief in the paranormal worldwide: Mexico, *Mendez-Acosta;* Netherlands, *Hoebens; U.K., Hutchinson;* Australia, *Smith;* Canada, *Gordon;* France, *Rovze.* Debunking, neutrality, and skepticism in science, *Kurtz.* University course reduces paranormal belief, *Gray.* The Gribbin effect, *Roder.* Proving negatives, *Pasquarello.*

WINTER 1983-84 (vol. 8, no. 2): Sense and nonsense in parapsychology, *Hoebens.* Magicians, scientists, and psychics, *Ganoe and Kirwan.* New dowsing experiment, *Martin.* The effect of TM on weather, *Trumpy.* The haunting of the Ivan Vassilli, *Sheaffer.* Venus and Velikovsky, *Forrest.*

FALL 1983 (vol. 8, no. 1): Creationist pseudoscience, *Schadewald.* Project Alpha: Part 2, *Randi.* Forecasting radio quality by the planets, *Dean.* Reduction in paranormal belief in college course, *Tobacyk.* Humanistic astrology, *Kelly and Krutzen.*

SUMMER 1983 (vol. 7, no. 4): Project Alpha: Part 1, *Randi.* Goodman's 'American Genesis,' *Feder.* Battling on the airwaves, *Slavsky.* Rhode Island UFO film, *Emery.*

SPRING 1983 (vol.7, no.3): Iridology, *Worrall.* The Nazca drawings revisited, *Nickell. People's Almanac* predictions, *Donnelly.* Test of numerology, *Dlhopolsky.* Pseudoscience in the name of the university, *Lederer and Singer.*

WINTER 1982-83 (vol. 7, no. 2): Palmistry, *Park.* The great SRI die mystery, *Gardner.* The 'monster' tree-trunk of Loch Ness, *Campbell.* UFOs and the not-so-friendly skies, *Klass.* In defense of skepticism, *Reber.*

FALL 1982 (vol.7, no.1): The prophecies of Nostradamus, *Cazeau.* Prophet of all seasons, *James Randi.* Revival of Nostradamitis, *Hoebens.* Unsolved mysteries and extraordinary phenomena, *Gill.* Clearing the air about psi, *Randi.* A skotography scam, *Randi.*

SUMMER 1982 (vol. 6, no. 4): Remote-viewing, *Marks.* Radio disturbances and planetary positions, *Meeus.* Divining in Australia, *Smith.* "Great Lakes Triangle," *Cena.* Skepticism, closed-mindedness, and science fiction, *Beyerstein.* Followup on ESP logic, *Hardin, Morris* and *Gendin.*

SPRING 1982 (vol. 6, no. 3): The Shroud of Turin, *Mueller.* Shroud image, *McCrone.* Science, the public, and the Shroud, *Schafersman.* Zodiac and personality, *Gauquelin.* Followup on quantum PK, *Hansel.*

WINTER 1981-82 (vol. 6, no. 2): On coincidences, *Ruma Falk.* Croiset: Part 2, *Hoebens.* Scientific creationism, *Schadewald.* Follow-up on 'Mars effect,' *Rawlins;* Responses by *CSICOP Council* and *Abell and Kurtz.*

FALL 1981 (vol. 6, no. 1): Gerard Croiset: Part 1, *Hoebens.* Test of perceived horoscope accuracy, *Lackey.* Planetary positions and radio propagation, *Ianna and Margolin.* Bermuda Triangle,1981, *Dennett.* Observation of a psychic, *McIntyre.*

SUMMER 1981 (vol. 5, no. 4): Investigation of 'psychics, *Randi.* ESP: A conceptual analysis, *Gendin.* The extroversion-introversion astrological effect, *Kelly and Saklofske.* Art, science, and paranormalism, *Habercom.* Profitable nightmare, *Wells.* A Maltese cross in the Aegean? *Loftin.*

SPRING 1981 (vol. 5, no. 3): Hypnosis and UFO abductions, *Klass.* Hypnosis not a truth serum, *Hilgard.* H. Schmidt's PK experiments, *Hansel.* Further comments on Schmidt's experiments, *Hyman.* Atlantean road, *Randi.* Deciphering ancient America, *McKusick. A* sense of the ridiculous, *Lord.*

WINTER 1980-81 (vol. 5, no. 2): Fooling some people all the time, *Singer and Benassi.* Recent perpetual motion developments, *Schadewald. National Enquirer* astrology study, *Mechler, McDaniel, and Mulloy.* Science and the mountain peak, *Asimov.*

FALL 1980 (vol. 5, no.1): The Velikovsky affair—articles by *Oberg, Bauer, Frazier.* Academia and the occult, *Greenwell.* Belief in ESP among psychologists, *Padgett, Benassi, and Singer.* Bigfoot on the loose, *Kurtz.* Parental expectations of miracles, *Steiner.* Downfall of a would-be psychic, *McBurney and Greenberg.* Parapsychology research, *Mishlove.*

SUMMER 1980 (vol. 4, no. 4): Superstitions, *Bainbridge and Stark.* Psychic archaeology, *Feder.* Voice stress analysis, *Klass.* Follow-up on the 'Mars effect,' Evolution vs. creationism, and the Cottrell tests.

SPRING 1980 (vol. 4, no. 3): Belief in ESP, *Morris.* UFO hoax, *Simpson.* Don Juan vs. Piltdown man, *de Mille.* Tiptoeing beyond Darwin, *Greenwell.* Conjurors and the psi scene, *Randi.* Follow-up on the Cottrell tests.

WINTER 1979-80 (vol. 4, no. 2): The 'Mars effect'—articles *by Kurtz, Zelen, and Abell; Rawlins; Michel and Fransoise Gauquelin.* How I was debunked, *Hoebens.* The metal bending of Professor Taylor, *Gardner.* Science, intuition, and ESP, *Bauslaugh.*

FALL 1979 (vol. 4, no.1): A test of dowsing, *Randi.* Science and evolution, *Godfrey.* Television pseudodocumentaries, *Bainbridge.* New disciples of the paranormal, *Kurtz.* UFO or UAA, *Standen.* The lost panda, *Van Kampen.* Edgar Cayce, *Randi.*

SUMMER 1979 (vol. 3, no. 4): The moon and the birthrate, *Abell and Greenspan.* Biorhythms, *Hines.* 'Cold reading,' *Randi.* Teacher, student, and the paranormal, *Kral.* Encounter with a sorcerer, *Sack.*

SPRING 1979 (vol. 3, no. 3): Near-death experiences, *Alcock.* Television tests of Musuaki Kiyota, *Scott and Hutchinson.* The conversion of J. Allen Hynek, *Klass.* Asimov's corollary, *Asimov.*

WINTER 1978-79 (vol. 3, no. 2): Is parapsychology a science? *Kurtz.* Chariots of the gullible, *Bainbridge.* The Tunguska event, *Oberg.* Space travel in Bronze Age China, *Keightley.*

FALL 1978 (vol. 3, no. 1): An empirical test of astrology, *Bastedo.* Astronauts and UFOs, *Oberg.* Sleight of tongue, *Schwartz.* The Sirius "mystery," *Ridpath.*

SPRING/SUMMER 1978 (vol. 2, no. 2): Tests of three psychics, *Randi.* Biorhythms, *Bainbridge.* Plant perception, *Kmetz.* Anthropology beyond the fringe, *Cole.* NASA and UFOs, *Klass.* A second Einstein ESP letter, *Gardner.*

FALL/WINTER 1977 (vol. 2, no. 1): Von Däniken, *Story.* The Bermuda Triangle, *Kusche.* Pseudoscience at *Science Digest, Oberg and Sheaffer.* Einstein and ESP, *Gardner.* Nrays and UFOs, *Klass.* Secrets of the psychics, *Rawlins.*

SPRING/SUMMER 1977 (vol. 1, no. 2): Uri Geller, *Marks and Kammann.* Cold reading, *Hyman.* Transcendental Meditation, *Woodrum.* A statistical test of astrology, *McGervey.* Cattle mutilations, *Stewart.*

FALL/WINTER 1976 (vol. 1, no. 1): Dianetics, *Wallis.* Psychics and clairvoyance, *Fine.* "Objections to Astrology," *Westrum.* Astonomers and astrophysicists as astrology critics, *Kurtz and Nisbet.* Biorhythms and sports, *Fix.* Von Däniken's chariots, *Omohundro.*

Letters to the Editor

Nikola Tesla and 'extraordinary science'

Jeff Johnson's articles about Nikola Tesla (*SI*, Summer 1994) bring welcome good sense and keen analysis to a field in which much nonsense has been published. As Johnson notes, Tesla was so good at obfuscating his tracks that a complete biography of him may never be written. However, let me make a few small comments.

First, there is one notable exception to the statement (p. 374) that "The Tesla coil . . . [has] no important scientific or industrial applications." In fact, small, hand-held Tesla coils have been used for decades for leak hunting in glass vacuum systems. The coil is run over the outside of the system. When the coil is near any crack or pinhole, the gas leaking through it conducts the discharge and glows brightly.

Johnson attributes the nonlethality of the Tesla discharge to the smallness of the current. But while most Tesla coils do in fact produce quite small currents, this is not the point. What really counts is the very high frequency, which gives rise to a phenomenon called the skin effect. High-frequency current passing through a conductor (in this case the human body) is confined to a very thin layer near the surface. Under the conditions obtaining here, the layer is so thin that it comprises almost entirely the dead cells that make up the outer epidermis.

It is worth reiterating Johnson's caution: *Tesla coils are safe as long as nothing goes wrong.* Persons with only a passing knowledge of high-frequency technique should not play with them.

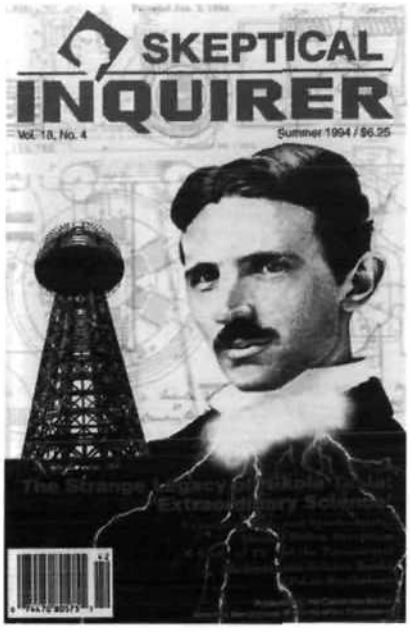
Finally, a personal note. My father was a physics student at CCNY and later at Columbia during the 1920s, and he often used the New York Public Library at Fifth Avenue and 42nd Street. On any day when the weather was good, he told me, Tesla would leave his quarters at the Hotel Pennsylvania (now the Statler Hilton) on Eighth Avenue and 33rd Street and walk the mile or so to Bryant Park, just behind the library. There attired impeccably in pearl-gray suit and hat, he would feed his beloved pigeons for hours. Sadly, Tesla's resources later dwindled to the point where he could no longer afford a business-class hotel and moved to seedier places, sometimes subsidized by his old friends. And his health eventually declined until he could feed the pigeons only at his window sill. He did live long enough, however, to see a dramatic integration of his two fruitful ideas. Tesla's original induction motor was not self-starting, but others developed high-starting-torque versions that could drive electric trains using AC sources. The IND subway system in New York, developed in the mid-thirties, was one of the first to use this now-dominant system.

Lawrence S. Lerner
Department of Physics
and Astronomy
California State University
Long Beach, Calif.

In Jeff Johnson's article on Tesla, he wrote that when in 1891 Tesla and George Westinghouse installed AC equipment in Telluride, Colorado, it "gave him, and the state, credit for the world's first practical commercial use of AC motors, generators, and transmission lines."

Actually the first successful attempt ever to transmit high-voltage alternating current by the principles employed today occurred in 1886, five years earlier. Interestingly enough, the inventor who accomplished that had been associated with George Westinghouse and had been hired by him in 1884 as chief engineer. That was William Stanley (1858-1916).
. . .

Samuel Sass
Librarian (retired)
General Electric Company
Pittsfield, Mass.



With reference to Jeff Johnson's article on "Tesla tripe," I have been preparing a book on Tesla (and other cranks) for several years and I must bring up a few quibbles. Johnson too quickly assumes that such concepts as zero-point energy and scalar electromagnetism are entirely bogus. The former is a bona fide (and fairly obvious) mathematical prediction of quantum mechanics. It cannot be dismissed out of hand, any more than can the predicted existence of tachyons. The treatment of electromagnetic problems by scalar fields is a standard mathematical "trick" that can be traced back as far as Euler (in a hydrodynamic context). However, these fields have only the same "reality" as do the individual terms of a Fourier series. By the way, one of the most amusing things about Tesla cranks is that, while they are inventing their own "death rays," they have completely missed the development of something very much like a "death ray" (electromagnetic projectiles—"3D solitons"), which is a fairly hot potato in the conventional physics literature.

My more serious quibble with Johnson is that he dismisses the cranks as

harmlessly massaging their own egos. Not so, they are seeking (and getting) political recognition on the back of the "Green" movement (PM machines do not pollute). Many of their conference proceedings contain a supportive message from a U.S. senator or state governor or similar figure. Think about it—if you are a scientific ignoramus (politician), there must appear to be little difference in the success rates of "hot fusion" and "cold fusion," so why not cancel the expensive one. One group of cranks claims the credit for stopping (by lobby) the construction of the superconducting supercollider—a very important (but expensive) physics experiment.

One of the most sinister recent trends, to my mind, has been the "crank invasion" of the IECEC (Intersociety Energy Conversion Engineering Conferences). These have been organized for some 30 years by the seven major engineering societies of the United States. The past five conferences have contained a section devoted to the presentation of the sort of nonsense Johnson describes. One is thus presented with the strange sight of prestigious conference proceedings that contain articles on perpetual-motion machines, psychically determined periodic tables of imaginary elements, etc. I complained about this to the executive director of the American Nuclear Society (which had hosted that particular conference). His reply was that the papers (whose standard was very much of the level implied by Johnson) had been subjected to peer review (by whom, the ghost of Nikola Tesla?) and that was that. I also received a five-page tirade from Patrick Bailey (who had chaired the loony session), who also strongly defended the cranks. Bailey also advised me to seek enlightenment from Harold Aspden (a notorious U.K. defender of perpetual-motion and antigravity machines) and from Colin Andrews (vis-à-vis crop circles). That would be like asking Uri Geller for advice on metallurgy.

So, things are not as innocent as Jeff Johnson implied. Wake up America, you are on the brink of your own brand of Lysenkoism!

David J. Fisher
Cardiff, U.K.

While I thoroughly enjoyed the last issue of your always excellent and thought-provoking magazine, a quote in the article about Tesla requires a comment. Jeff Johnson quoted Martin Gardner as observing that "pseudoscientists tend to fall into two groups: those motivated to defend some religious dogma and those motivated by the belief in their own greatness. . . ."

There is at least one other source of pseudoscience, and this source is far more influential than either of the two mentioned. I refer to pseudoscience used to support ideological goals. We cannot forget the abuses Marxism-Leninism and Fascism perpetrated under the guise of science, and typically under the guidance of scientists themselves. However, we need not look to Lysenkoism or eugenics for an example of ideologically driven pseudoscience. Our contemporary period is rife with similar balderdash, and some of these concepts, alas, are apparently supported by eminent Fellows of CSICOP.

Credible scientists can become enthralled by theories fitting their ideological biases, becoming incapable of a balanced analysis. Evidence supporting, for instance, the theories of nuclear winter, aerosols and the allegedly expanding Antarctic ozone hole, and global warming are in my opinion insufficient, insubstantial, and certainly subject to alternative interpretation. Weak data, however, have not stopped several eminent scientists from writing gloomy popular screeds demanding political actions to address these "threats." It is no wonder that the public-at-large holds scientists in such low esteem. After all, if scientific conclusions are determined by personal political prejudice why should a scientist's pontifications be considered any more rational than those of any kooky ideologue?

We continue to see pseudoscience used to support social agendas. The purveyors of such nonsense, however, are not religious fanatics, but scientists unable to separate their political ideas from their scientific conclusions.

Chris Centner
Reston, Va.

TV and the paranormal

I enjoyed reading the Summer 1994 issue, especially the article "Do Televised Depictions of Paranormal Events Influence Viewers' Beliefs?" I found the article both informative and, in some ways, amusing. What I found most amusing were some of the statements the participants were asked if they agreed with, disagreed with, or were uncertain about. My favorite was "It is possible to cast spells on individuals," to which I would have to respond with an emphatic "demonstrably true." And this should surprise no one, for even in Shakespeare's time we see:

> GLENDOWER: I can call spirits
> from the vasty deep.
> HOTSPUR: Why, so can I, or so
> can any man,
> But will they come when you
> do call for them?
>
> —*King Henry IV,*
> First Part (III, i, 53)

Clearly, there is a substantial difference between invoking something and its coming to pass. I can cast many spells on individuals and no one can say it is impossible. But will the spell have its intended effect on the targeted individual? I expect not.

I would also have to agree that "Witches and warlocks do exist," if I am to believe the few people who have confided to me that they practice witchcraft—the rituals of Wicca or other pagan religions. There are, of course, many vocal adherents to these practices and beliefs who seem more interested in their own fame than anything else, but I strongly suspect that most real practitioners of witchcraft and other pagan religions are silent. I also suspect that these practices are very rare overall, which contributes to the difficulty of their study.

Another statement I believe can only be agreed with is: "A person's thoughts can influence the movement of a physical object." It is clear, at least to me, that my own thoughts controlled my fingers as they typed this letter. These thoughts directly control the physical objects of my fingers, hands, and arms. Indirectly, these objects influence the movement of other objects, such as the keys of the keyboard and the computer's mouse. It should be obvious that thoughts can influence the movement of physical objects. Why, I can even control other physical objects without touching

them directly—I use the infrared remote-controls for my TV and VCR almost every day.

I also believe that some of the other statements are somewhat flawed, since they are compound statements that assert things that are not necessarily identical. In particular, any statement about "spirit" or "spirits" could be construed as being about a person's soul. Many people believe in the existence of a soul or "person's spirit" as part of their religious faith, yet these same people do not believe in ghosts. Thus, a compound statement grouping spirits with ghosts may be a source of confusion. . . .

Gregory Guerin
Tempe, Ariz.

Reductionist school texts

In regard to Frank Reuter's article "The Synthetic Mind Clashes with the Reductionist Text" (*SI,* Summer 1994), I have to agree that he is absolutely right about the quality of the kind of textbook he quotes from. Dreadful stuff. But isn't this the result of policies sacred to the education establishment? Ten-word sentences; colorlessness; limited vocabulary? Textbook publishers are not their own masters. They have to publish what the establishment wants.

Furthermore, I have to disagree with Reuter about what makes this kind of writing so unreadable. Not simplistic sentences alone. The real villain is bad paragraphing.

A paragraph should establish a subject, discuss it, and come to some conclusion, then move on to the next subject. The paragraph Reuter quotes changes the subject with every sentence.

Writing *must* have continuity and flow. One idea *must* be completed first and then lead naturally to the next. If not, the reader will be brought up short, baffled by a sudden surrealistic about-face.

No doubt the changes suggested above violate some rigid ed-biz dogma, and if so, then the rigid ed-biz dogma is *wrong.* But it's no use railing at textbook publishers about it. They have to please the ed-biz moguls, or they sell no textbooks.

Ann Finlayson
Warwick, N.Y.

I share Frank Reuter's frustration with simplistic prose in school textbooks. As an educational researcher I believe much of this is due to the professional necessity to write to the "reading level."

Materials I design to be used in the classroom must be age-appropriate. To defend my materials as such, I must use an established readability formula, most of which involves shortening sentences, eliminating multisyllable words, and in the case of the Dale-Chall reading list, eliminating words that most students of that age do not recognize. This results in choppy, simplistic text with short sentences and monosyllabic words. Several students have commented on this type of writing as "irritating" when responding to surveys about my materials.

In fact, we are advised to design our materials to be appropriate for one grade level *below* the age we actually want to work with, to be sure all the students understand all the materials. If I work with sixth-grade students, I must write for the fifth-grade reading level.

I believe that by dumbing down these materials, we hold students to an appropriately low standard. Students should strive to reach a higher goal, not be forced to a lower standard in the name of equality in the classroom.

One student complained about a piece of mine on tracking bears that wear radio collars. I spent several choppy sentences explaining how the radio worked, and he asked, "Why didn't you just say it was a transmitter?" I answered, "Because according to the Dale-Chall Readability Formula, you don't know what that means."

Marjorie Woodruff
Newton, Mass.

Frank Reuter replies:

The substance of Ann Finlayson's and Marjorie Woodruff's letters is that the cause of bad prose in school texts is "the education establishment" or "an established readability formula." Of this there can be no doubt; so much bad prose in the same reductionist style *cannot exist by accident. Consider the common textbook publishers' guidelines (such as the Dale-Chall reading list) never to use a word a student doesn't already know. Researchers have demonstrated that ten-year-olds have vocabularies far exceeding the number of days they have lived. How can this be? Obviously children learn words "automatically" by hearing or reading them in contexts. The richer the reading experience is, the larger will the child's vocabulary be.*

Publishers need to rethink the established formulas. Frankly, those who do will eventually benefit economically; inferior products cannot pass the test of time.

Examining Jung's archetype

Ernest Gallo's extremely well set forth and reasoned article "Synchronicity and the Archetypes" (*SI,* Summer 1994) succeeded in thoroughly debunking Jung's tenuous but (alas) widely accepted views on universal archetypes.

But Gallo stepped into tenuous terrain himself when he threw out the following query and subsequent oversimplified reply: "If the Jungian approach cannot be made rigorous, can modern science perhaps be made to seem poetic, evocative—i.e., something less than rigorous? If so, then Jung can claim to be, at least in some very loose sense, scientific.

Gallo is confused here. Most science is indeed poetic and evocative, and yet rigorous nonetheless. Gallo seems to subscribe to the Newtonian belief in scientific absolutes, a belief that is no less baseless than Jung's.

To buttress my point better than I can myself, I need only refer to the quote from Stephen Jay Gould that you included in the same issue. Gould alludes to the "messy and personal side of science." (I would substitute "poetic" and "evocative" for "messy" and "personal.") And he avers that ". . . scientists should proudly show this human face, to display their kinship with all other modes of creative human thought." The renowned poet and scientist Goethe could hardly have said it better.

Anyone who does not recognize that even the hardest of the hard sciences, in their essence, have an underlying poetry and evocativeness, is just as loosely scientific, if not more so, as Jung. One of Jung's primary shortcomings was not his will to interpret everything; rather, it was his facile inclination to settle for one pat interpretation in the face of many other competing, and no less plausible, interpretations.

Christopher Phillips
Takoma Park, Md.

Ernest Gallo takes issue with the concept of archetype in the general structure and premises of Jungian psychology. Not only does he trivialize Jung's work and the ongoing scholarship and practice of Jungian psychotherapy, but he seems to set up straw men to knock down. Even during Jung's lifetime the concepts employed in the practice of depth psychotherapy were undergoing change and evolution. No one that I know actually saw the archetypes to be as formless as Gallo suggests. I and others understand the archetypes to be part and parcel of the collective unconscious. It is difficult to imagine that human society and culture, relationships within groups and between individuals of a family, based as they are on one or two million years of evolution, could be anything other than inborn to a large degree. I heartily disagree that human societies and cultures are as different as Gallo states. Jung himself took the example of the yucca moth, which with only a few ganglia for brains, so to speak, knows the yucca flower from birth. Although I have not been able to establish an intellectual connection between Jung and Julian Jaynes, Jaynes certainly confirms most of Jung's concepts with his own observations and conjectures. This always seems to be troubled ground to walk. I heard Jaynes in a public lecture at San Diego State University many years after the publication of his seminal *The Origin of Consciousness in the Breakdown of the Bicameral Mind.* At that lecture even he seemed to be backing away from some of his original, but in my view very brilliant, thoughts. As for Von Franz and her book on number, I could not agree more with Gallo. However, much of the rest of Von Franz's work on fairy tales is brilliant, and her insights into the functioning of the unconscious have been of enormous use in psychological healing. . . . Jung and countless other writers have brought forth innumerable examples of the truth of the destructiveness of the unrecognized unconscious darkness, both on the collective and the individual level. All of this has been glossed over by Gallo in his attempt to pejoratively knock down this "house of cards."

John M. Hood, Jr.
San Diego, Calif.

Ernest Gallo attempts to refute the existence of Jungian synchronicity. He cites the story of Jung's troubled patient who dreamed of a scarab and underwent positive change before Jung's eyes when a scarablike beetle flew into the room. Gallo then tries to show that Jung is wrong in attributing mysticism to the event because, although a beetle can be a symbol of rebirth, it can have many other meanings as well. This misses the point of Jung's story.

The mysticism in the event has something to do with the fact that the beetle can have a symbolic meaning, but the reason the event had impact was the synchronicity of events. What are the odds that a beetle would fly into Jung's room? Multiply that by the odds that the beetle would do so when a woman who had dreamed of a beetle was there. Then multiply the result by the odds that the woman would be talking about her dream the moment the beetle entered. It is because of the high probability against this that Jung sought a pattern, finding it in the rebirth archetype. Thus, I think a better way to debunk Jung is to attack his implicit assumption that the event with the beetle was worthy of explanation, rather than to attack the way he chose to explain it.

Coincidences like the beetle incident are improbable, but life is long. Over the course of life, unlikely events are bound to happen. My guess is that the greatest unlikelihood of them all is that anyone could reach Jung's age without having witnessed several startling and memorable coincidences. If it hadn't been the beetle, it would have been something else.

Coincidence seems to demand explanation; but over time, lack of coincidence would be far stranger. Thus Jung's fundamental error was not how he interpreted the beetle event but that he interpreted it at all. Gallo gives Jung more credit than Jung deserves.

Daniel H. Bigelow
Cathlamet, Wash.

Ernest Gallo responds:

Daniel Bigelow's point is a good one. The difficulty is that Jung would agree *that such coincidences do happen, but would insist that they are meaningful ones. I argue that it is actually very easy to find some sort of match between a personal event and the vast body of myth, especially if one's key words (e.g., regeneration, rebirth) are kept nicely vague. In this way we meet Jung's argument on Jung's own ground.*

Of course I agree with Christopher Phillips that science is poetic, evocative. But Jung claimed parallels between modern physics and his doctrines: e.g., relativity proves that the psyche is independent of space and time, etc. The views of others (cited in the article) are even more embarrassing, e.g., the amazing notion that Rorschach tests depend on wormholes in spacetime. Science isn't as evocative as all that!

I must disagree with John Hood. The forms of human society and culture are not *inborn, for the simple reason that acquired characteristics are not inherited. The doctrine that behavior produces heritable memory-traces* (mnemes) *was proposed by Ewald Hering in 1870 and held by Eugen Bleuler, formerly Jung's chief at the Burghölzli asylum, in 1932. As late as 1954—a year after Watson and Crick put forward their hypothesis about the structure of DNA—Jung stoutly defended the Lamarckian implications of his doctrine of the archetypes. But by the mid-1930s Lamarckism was dead. It still is.*

The big doodley science show

Ralph Estling (*SI,* Forum, Summer 1994) lambastes what he labels "infamous" nonscientists who dare to consider wild ideas outside the bounds of logical deduction and rational analysis. He seems to ignore that an essential aspect of the scientific method is the formulation of creative hypotheses to be used as the basis for the application of such logical analysis to predict consequences to be tested versus actual observation. This intuitive, creative aspect of science is as important as the rational aspect. Bohr once told a wild (non?)scientist that his idea was crazy, but not crazy enough! Einstein's fundamental insights of equivalence and space/matter relations came out of philosophical musings about the nature of the universe, not from rational analysis of observational data—the logical analysis, prediction, and testing coming only after the formation of creative hypotheses. One of the greatest needs today in fundamental particle/force physics is some similar insight and principle to provide a "philosophical" grounding for the cur-

rent "theories of everything." Why 10 or 26 or 4 dimensions? Why the observed masses and force constants among the particles? And so on. Yes, wild-ideaed cosmologists and theoretical physicists like Wheeler, Bohm, Davies, Thorne, Gell-Mann, Penrose, Weinberg, Witten, Borrow, Hoyle, et al., may break the bounds of known rational analysis in search of some "final hypothesis" to ground today's theories of everything. But if such is to be found it will most likely be by such hypothesists, unfettered by logical rationality and guided by creative intuitive comprehension and insight.

R. H. Davis
Palo Alto, Calif.

I do not know what the curious Forum column by Ralph Estling is doing in the SKEPTICAL INQUIRER. After a long, rambling build-up, it finally makes its point that the author does not "think" that the current cosmological view of the beginning of the universe is based on science. No scientific argument or justification for this "thought" is given.

The fact is that the cosmological view is obtained by applying the empirically derived laws of physics as they are currently understood and, instead of projecting forward to predict the future, tracing backward from the currently observed universe to infer the past. The result is that the current universe is found to be the natural evolution from an extremely hot, dense, compact universe of many billions of years ago. What more does Estling expect before he will call it science?

John G. Fletcher
Pleasanton, Calif.

In the opening paragraph of his Forum article, Ralph Estling clearly states his intent: "Let us lambaste infamous men, those who call themselves scientists and perhaps honestly believe themselves to be scientists and indeed have the post-nominals to show it, but who are *not* scientists." Then there is a lot of babble and "The problem emerges in science when scientists leave the realm of science and enter that of philosophy and metaphysics, too often grandiose names for mere personal opinion, untrammeled by empirical evidence or logical analysis, and wearing the masks of deep wisdom."

I agree that there are many instances of persons holding degrees in science who are guilty of those kinds of things, but not very often by those actually doing science. But when Estling finally provides us with an example of what is bugging him it is he who is way off base:

> . . . And so cosmologists have given us Creation *ex nihilo,* Everything out of Nothing, our own, our very own scientifically authenticated Genesis-come-lately. And at the same instant of this Creation, they inform us, almost parenthetically, the universe possessed the interesting attributes of Infinite Temperature, Infinite Density, and Infinitesimal Volume, a rather gripping state of affairs, as well as something of a sudden and dramatic change from Nothing whatever. They then intone equations and other ritual mathematical formulae and look upon it and pronounce it good.
>
> I do not think that what these cosmologists, these quantum theorists, these universe-makers, are doing is science. I can't help *feeling* [emphasis added] that universes are notoriously disinclined to spring into being, ready-made out of nothing. . . .

I am not a cosmologist but my understanding is that the science of the Big Bang is science at its very best. Cosmologists have found that the Big Bang theory of development of the universe is the only theory that is consistent with the general laws of physics and with the many and varied physical observations that have been made to date. It is not the scientists who "leave the realm of science and enter that of philosophy and metaphysics, too often grandiose names for mere personal opinion," it is Estling who is guilty of this because of his philosophical, or religious, or whatever views.

Donald C. Leigh
Lexington, Ky.

Imagine my surprise when I read Ralph Estling's column, received the same day the postman picked up my submittal to you of an article on the same subject. His article is certainly far more interesting reading than the one I submitted; his choice of adjectives and his style of writing are superb. Still, I don't think he was hard enough on those "quasi-scientists." *SI* makes much ado about the danger to society and science from the pseudosciences and paranormal propaganda, etc., but those self-proclaimed metaphysicists, the theoretical physicists, the mathematicians, are at the top of the ivory towers of science; they are the gurus. Can there be any doubt that a large number of budding young scientists have hopes of discovering a gateway to another dimension, of building a time machine or some electronic apparatus to enhance mind-reading ability. As a youth I had such dreams, and I only read about such things in science-fiction magazines. Had one of my professors been engaged in the pursuits Estling decries, I would most likely not be a skeptic today. I would still be searching for that elusive equation, that variable that allows heat to flow uphill, that allows electrons to flow backwards in time. An even more insidious effect those ivory tower gurus have is on the media. Not just the public media but the scientific journals as well. . . .

Donald Weitzel
Winnetka, Calif.

Ralph Estling replies:

All things begin with speculation, science not excluded. But if no empirical evidence is eventually forthcoming, or can be forthcoming, all speculation is barren. To get down to particulars: We have strong indications that the observable universe was once far denser and hotter. This condition can, at least theoretically, be traced back to 10^{43} second after Time 0, the exact instant of creation. There is no evidence, so far, that the entire universe, observable and unobservable, emerged from a state of absolute Nothingness. Quantum cosmologists insist both on this absolute Nothingness and on endowing it with various qualities and characteristics: this particular *Nothingness possesses virtual quanta seething in a false vacuum. Quanta, virtual or actual, and vacuum, false or true, are not Nothing, they are definitely Something, although we may argue over what exactly. For one thing, quanta are entities having energy, a vacuum has energy and, moreover, extension, i.e., it is something into which other things, such as universes, can be put, i.e., we cannot have our absolute Nothingness and eat it too. If we have quanta and a vacuum as given, we in fact have a pre-existent state of existence*

that either pre-existed timelessly or brought itself into existence from absolute Nothingness (no quanta, no vacuum, no pre-existing initial condition) at some precise moment in time; it creates this time, along with the space, matter, and energy, which we call the universe. R. H. Davis mentions Paul Davies. I've had some correspondence with Paul Davies on cosmological theory, in the course of which I asked him what he meant by "Nothing." He wrote back that he had asked Alexander Vilenkin what he *meant by it and that Vilenkin had replied, "By Nothing I mean Nothing," which seemed pretty straightforward at the time, but then these quantum cosmologists go on from there to tell us what their particular breed of Nothing consists of. I pointed this out to Davies, who replied that these things are very complicated. I'm willing to admit the truth of that statement, but I think it does not solve the problem.*

'Science in the New Age'

The review of my book *Science in the New Age: The Paranormal, Its Defenders and Debunkers, and American Culture* (*SI*, Summer 1994) contains several factual errors and misrepresentations. First, my position is explicitly sociocultural and anthropological. I devote an entire chapter to the argument that social scientists and cultural-studies researchers can and do provide a fourth perspective on the paranormal that is independent of those of skeptics, parapsychologists, and New Agers. The reviewer apparently did not reach or understand that chapter, as well as much of the rest of my book.

Second, the reviewer argues that the bulk of my citations indicate a New Age bias. The facts are that more than half of the citations (223) are from skeptical or neutral social scientists, humanities researchers, and journalists, with another 70 from CSICOP-affiliated writers. New Agers constitute only 36 of the citations. Although the reviewer's decision to operationalize bias by counting citations is methodologically flawed, even his own methods contradict this argument.

Third, the reviewer falsely claims that I advocate a form of deconstruction that rejects belief in reality or reason. The reviewer apparently did not read my appendix on methodology or my other discussions of methodology. I borrow from deconstruction some useful interpretive techniques that I combine with methods from other fields. Clearly, I operate within the empirical tradition of the social sciences and humanities. I do not accept the wild philosophical claims that the reviewer attributes to deconstruction, which he understands so poorly that he has to rely on dictionary and encyclopedia entries.

Fourth, the reviewer seems to think that only quantitative methods constitute acceptable "scientific" research. That position is in conflict with the well-developed field of qualitative social-science-research methods, which I teach in a graduate seminar, as well as the qualitative methods used by many skeptics.

Fifth, the reviewer's own rhetoric confirms my analysis. For example, he attempts to associate me with the "drug culture that is pervading and corrupting our cities," a rhetorical move similar to those analyzed in my chapter that discusses the rhetoric of the jeremiad.

In *Science in the New Age* I have outlined a more sophisticated, rational form of reflexively skeptical cultural analysis that is informed by current research in the social studies of knowledge, cultural studies, feminist science studies, and cultural anthropology. The reviewer's lack of familiarity with research advances in these fields is a tedious example of a dogmatic, irrational form of skepticism that will ultimately discredit the skeptical movement's attempts to gain credibility among competent researchers in the social sciences and humanities.

David J. Hess
Science and Technology
Studies Dept.
Rensselaer Polytechnic Institute
Troy, N.Y.

Lee Loevinger responds:

David J. Hess objects to the review of his book Science in the New Age, *alleging "several factual errors and misrepresentations." However, the bulk of the review consists of actual quotations or close paraphrases of the text of the book, and Hess has failed to specify a single error in quotation or paraphrase.*

His letter, like his book, is couched in pretentious abstractions from which it is difficult to extract any specific meaning. But he seems to object to the fact that the review emphasizes what he terms (to quote the title of his first chapter) "The Three Cultures: New Age, Parapsychology, Skepticism." The book from the first to the last page is replete with references to these three "cultures," and this constitutes the major theme. However, the review does state that Hess claims these three cultures are, at bottom, "aspects of a single 'paraculture,'" and notes that parapsychologists and skeptics might find a middle ground from which to "study paranormal beliefs and practices" by abandoning the search or demand for scientific data or proof.

The review does not claim, as Hess alleges, that he advocates deconstruction. It states quite explicitly that the book "is a good example of deconstruction in action." The difference should be apparent to anyone who claims to be a scholar or a student of social science. In any event, Hess himself, in the appendix on methodology, terms his own approach "cultural reconstructivism" and in his letter admits that he borrows some useful techniques from deconstruction.

The truly significant misrepresentation is in the title of the book. The most basic definition of "science" (which Hess seems to accept at page 180) is that it is the name for what scientists do. I have read the work and writings of scientists from Galileo, through Einstein, and to Feynman, Hawking, Penrose, and Steven Weinberg. There is nothing in the work of any bona fide scientist that would come close to giving sanction to the use of the term science *as part of the title for this book. A candid and descriptive title would be "Superstition in the New Age."*

Correction

John Brunner has pointed out that I made an error in my review of Gary Taubes's *Bad Science: The Short Life and Weird Times of Cold Fusion*, (*SI*, Spring 1994, pp. 296-298). I ended the review by commenting on René Blondlot's spending his final years pining away in Nice. Of course I should have remembered he pined away in Nancy, not Nice. My apologies for the error and thanks to Brunner for pointing it out.

—*Terence Hines*

Lee Loevinger seems perplexed by David Hess's *Science in the New Age,* which is postmodern a la Derrida. We skeptics claim that parapsychology should not make any scientific claims, and Hess in essence agrees. But Hess uses *literary* criteria for truth, not *scientific.* And political correctness: Since science is not feminist, third world, ecological, irrational, then parapsychology is superior to it—*because it is unscientific.* The skeptical Lee, used only to scientific criteria, must stand there bemused.

However, I had some ideas for a case against Hess's postmodernism. Hess's criteria are convincing only as long as no one challenges them; once challenged, they seem a little silly. Literary criticism, like Hess's, is abstract and "objective." This is ironic, because postmodernists claim to prize direct experience above all else. Of course they are much farther from that than science is. Has literary criticism really done anything for women, the third world, the ecology, etc., except sing their praises? Science at least has done something for its constituents: because of it, we travel faster, do more work, eat better, and live longer.

Richard A. Dengrove
Alexandria, Va.

A skeptic's near-death experience

Laura Darlene Lansberry's report of her near-death experience (NDE) (*SI,* Summer 1994) was remarkable, as much for her integrity and humility as for the experience itself. Many authors in the field of near-death studies—both experiencers and skeptics alike—claim to have all the answers but fail to present any supporting data. It was refreshing to read Lansberry's straightforward account and her forthright refusal to leap from her individual NDE to global pronouncements.

She was not, however, the first skeptic to have written about his or her NDE. Neurologist Ernst Rodin described his experience in the *Journal of Nervous and Mental Disease* in 1980, regarding it as a toxic psychosis, much as Lansberry interpreted her experience as "merely a physiological phenomenon."

While I applaud Lansberry's integrity and would never deny that she had a profound experience, it is worth noting that neither hers nor Rodin's meets commonly applied research criteria for an NDE. Lansberry described only time distortion and a sensation of starting down a tunnel and seeing a light at its end; Rodin described only tremendous bliss and a conviction that he had died. By commonly used research criteria, such as Kenneth Ring's (1980) Weighted Core Experience Index, or my own NDE Scale, neither of these descriptions is sufficient to be categorized as an NDE. In that context, it is perhaps not so surprising that neither Lansberry nor Rodin attributed any nonphysiological significance to their experiencers.

Bruce Greyson
Department of Psychiatry
University of Connecticut
School of Medicine
Farmington, Conn.

As a neurologist, I would like to offer at least two possible explanations for Laura Lansberry's "tunnel" in her near-death experience.

Given that her heart stopped, she suffered a loss of blood pressure. Consciousness is not lost immediately, but those areas of the eye and brain that are more sensitive to loss of blood pressure, those areas furthest removed from the source, will be affected first. Since the vitreous of the eye exerts a significant pressure on the retina, the eye, and therefore vision, is first affected during hypertension. The area of the retina first affected is the periphery, which corresponds to our peripheral vision being lost, hence tunnel vision. Lie down or squat for a while and then get up, and you will demonstrate this fact for yourself.

The second explanation is that central vision has dual representation in the occipital lobe, whereas peripheral vision does not. In addition, many areas of the occipital lobe subserving peripheral vision lie at a watershed between two different blood supplies and are vulnerable to hypertension. Therefore, central vision will be spared longer than peripheral vision.

I can't speak to the nontunnel experiences that people going through near-death have claimed to have had. Certainly, the behavior of the reversibly injured brain is worth study. But, in the same issue of *SI,* 70 percent of people in one study believe in ghosts and spirits and 30 percent believe in astral projection. Given those data, a close call with death, which has a profound effect upon any of us who have experienced it, might be expected to bring forth some interesting comments.

Michael S. Smith, M.D.
Tucson, Ariz.

Re "A Skeptic's Near-Death Experience"—our grandmothers would have called that *fainting.* If you are not knocked out by a sudden and brutal blow, if your blood pressure becomes too low for whatever reason, loss of blood, or fibrillating of the heart, or any reason to lower the oxygen content of the blood in your brain, as asphixia or anoxia, high altitude or high "g," you will faint. Slowly, but surely. As all aviators know, your first lesson in aerobatics is gun-barrel vision and passing out, painlessly and quite pleasantly. A little bit later, you will recognize the phenomenon, brace against it, and learn to delay it, then to get out of the mess by lowering your g-force, wearing a pressure suit, and still later wearing a fighter-pilot suit whose purpose is to maintain a few seconds longer the blood pressure in your head by compressing the lower members, big masses of muscles that are great consumers of blood flow.

The first thing to go is lateral vision, probably the arteries are smaller in the periphery of my retina, and they cut out all vision except in the central part: gun-barrel vision.

Then that goes too, and you are blind. By the way, you are also deaf, the engine and aerodynamic noises fade into nothingness. If somebody would prick you, or burn you, you probably would not feel a thing.

Then you pass out. If you are not taken out of this situation, after a few minutes your brain gets permanent damage; and if still not relieved, you die.

So it is indeed a near-death experience. . . .

Michael Spinner
Saint Witz, France

The letters column is a forum for views on matters raised in previous issues. Letters should be no more than 250 words. Due to the volume of letters, not all can be published. They should be typed double-spaced. Address: Letters to the Editor, SKEPTICAL INQUIRER, 944 Deer Dr. NE, Albuquerque, NM 87122

Local, Regional, and National Skeptic Organizations

The organizations listed below have aims similar to those of CSICOP but are independent and autonomous. They are not affiliated with CSICOP, and representatives of these organizations cannot speak on behalf of CSICOP.

UNITED STATES

ALABAMA. Alabama Skeptics, Emory Kimbrough, 3550 Watermelon Road, Apt. 28A, Northport, AL 35476 (205-7592624) .

ARIZONA. Tucson Skeptics Inc. James McGaha, Chairman, 7049 E. Tangue Verde Rd., Suite 370, Tucson, AZ 85715. **Phoenix Skeptics,** Michael Stackpole, Chairman, P.O. Box 60333, Phoenix, AZ 85082.

CALIFORNIA. Bay Area Skeptics, Wilma Russell, Secretary,17723 Buti Park Court, Castro Valley, CA 94546. **East Bay Skeptics Society,** Daniel Sabsay, President, P.O. Box 20989, Oakland, CA 54620 (510-420-0702). **Sacramento Skeptics Society,** Terry Sandbek, 3838 Watt Ave., Suite C303, Sacramento, CA 95821-2664 (916-488-3772).

COLORADO, WYOMING, UTAH, and MONTANA. Rocky Mountain Skeptics, Bela Scheiber, President, P.O. Box 7277, Boulder, CO 80306 (303-444-5368).

CONNECTICUT. (See New York Area Skeptics, New York.)

DISTRICT OF COLUMBIA, DELAWARE, MARYLAND, and VIRGINIA. National Capital Area Skeptics, clo D. W. "Chip" Denman, 8006 Valley Street, Silver Spring, MD 20910.

FLORIDA. Tampa Bay Skeptics, Gary Posner, 1113 Normandy Trace Rd., Tampa, FL 33602 (813-221-3533).

GEORGIA. Georgia Skeptics, Becky Long, President, 2277 Winding Woods Dr., Tucker, GA 30084.

ILLINOIS. Midwest Committee for Rational Inquiry, Danielle Kafka, President, P.O. Box 2792, Des Plaines, IL 60017-2792. **Rational Examination Assoc. of Lincoln Land** (REALL), David Bloomberg, Chairman, P.O. Box 20302, Springfield IL 62708 (217-787-9098).

INDIANA. Indiana Skeptics, Robert Craig, Chairperson, 5401 Hedgerow Drive, Indianapolis, IN 46226.

KENTUCKY. Kentucky Assn. of Science Educators and Skeptics (KASES), Chairman, Prof. Robert A. Baker, 3495 Castleton Way North, Lexington, KY 40502.

LOUISIANA. Baton Rouge Proponents of Rational Inquiry and Scientific Methods (BR-PRISM), Dick Schroth, Director, 425 Carriage Way, Baton Rouge, LA 70808 4828 (504-766-4747).

MASSACHUSETTS. Skeptical Inquirers of New England. Contact Laurence Moss, Ho & Moss, 72 Kneeland St., Boston 02111.

MICHIGAN. Great Lakes Skeptics, Carol Lynn, contact, 1264 Bedford Rd., Grosse Pointe Park, Ml 84230-1116.

MINNESOTA. Minnesota Skeptics, Robert W. McCoy,549 Turnpike Rd., Golden Valley, MN 55416. St. **Kloud ESP Teaching Investigation Committee** (SKEPTIC), Jerry Mertens, Coordinator, Psychology Dept., St. Cloud State Univ., St. Cloud, MN 56301.

MISSOURI. Kansas City Committee for Skeptical Inquiry, Verle Muhrer, Chairman, 2658 East 7th, Kansas City, MO 64124. **Gateway Skeptics,** Chairperson, Steve Best, 6943 Amherst Ave., University City, MO 63130.

NEW JERSEY. (See New York Area Skeptics, New York.)

NEW MEXICO. New Mexicans for Science & Reason, John Geohegan, Chairman, 450 Montclaire SE, Albuquerque, NM 87108; John Smallwood, 320 Artist Road, Santa Fe, NM 87501 (505-988-2800).

NEW YORK. New York Area Skeptics (NYASk), Wayne Tytell, contact person, 159 Melrose Ave., E. Massa-pequa, NY 11758, (516) 798-6902. **Western New York Skeptics,** Tim Madigan, Chairman, 3965 Rensch Rd., Buffalo, NY 14228.

OHIO. South Shore Skeptics, Page Stephens, 6006 Fir Avenue, Cleveland, OH 44102 (216-631-5987). **Association for Rational Thinking** (Cincinnati area), Joseph F. Gastright, Contact, 111 Wallace Ave., Covington, KY 41014 (606-581-7315).

PENNSYLVANIA. Paranormal Investigating Committee of Pittsburgh (PICP), Richard Busch, Chairman, 8209 Thompson Run Rd., Pittsburgh, PA 15237 (412-3664663).

TEXAS. Houston Association for Scientific Thinking (HAST), Darrell Kachilla, P.O. Box 541314, Houston, TX 77254. **North Texas Skeptics,** Joe Voelkering, President, P.O. Box 111794, Carrollton, TX 75011-1794. **West Texas Society to Advance Rational Thought,** Co-Chairmen: George Robertson, 4700 Polo Pky., Apt. 183, Midland, TX 79705-1542.

WASHINGTON. The Society for Sensible Explanations, P.O. Box 7121, Seattle, WA 98133.

WISCONSIN. Contact person: Roxine McQuitty, MATC-West, 1200 S. 71st St., West Allis, WI 53214 (414-456-5402, 414873-4446, McQultty@Music.lib.MATC.edu).

ARGENTINA. CAIRP, Director, Ladislao Enrique Marquez, Jose Marti, 35 dep C, 1406 Buenos Aires.

AUSTRALIA. National: **Australian Skeptics,**P.O. Box E324 St. James, NSW 2000. Regional: **Australian Capital Territory,** P.O. Box 555, Civic Square, 2608. **Newcastle Skeptics,** Chairperson, Colin Keay, Physics Dept., Newcastle University, NSW 2308. **Queensland,** P.O. Box 2180, Brisbane,4001. **South Australia,** P.O. Box 91, Magill,5072. **Victoria,** P.O. Box 1555P, Melbourne, 3001. **Western Australia,** 25 Headingly Road, Kalamunda 6076.

BELGIUM. Committee Para, J. Dommanget, Chairman, Observatoire Royal de Belgique, Avenue Circulaire 3, B-1180 Brussels. SKEPP, W. Betz, Secretary, Laarbeeklaan 103, B1090 Brussels (FAX: 32-2-4774301).

BRAZIL. Opc3O Racional, Luis Gutman, Rua Santa Clara,431, Bloco 5, Apt. 803, Copacabana - Rio de Janeiro 22041-010 (021227-8694).

CANADA. Alberta Skeptics, Heidi Lloyd-Price, Secretary, P.O. Box 5571, Station A, Calgary, Alberta T2H 1X9. **British Columbia Skeptics,** Lee Moller, contact, 1188 Beaufort Road, Vancouver V7G 1R7. **Manitoba Skeptics.** Contact John Toews, President, Box 92, St. Vital, Winnipeg, Man. R2M 4A5. **Ontario Skeptics,** Henry Gordon, Chairman, 343 Clark Ave West, Suite 1009, Thornhill Ontario L4J 7K5. **Sceptiques du Quebec:** Jean Ouellette, C.P. 202, Succ. Beaubien, Montreal H2G 3C9.

CZECH REPUBLIC. Contact Milos Chvojka, Inst. of Physics, Czech Academy of Sciences, Na Slovance 2, 1 80 40 Prague 8.

ESTONIA. Contact Indrek Rohtmets, Horisont, EE 0102 Tallinn, Narva mnt. 5.

FINLAND. Skepsis, Lauri Grohn, Secretary, Ojahaanpolku 8 B17, SF-01600 Vantaa.

FRANCE. Comite Francais pour l'Etude des Phenomenes Paranormaux, Claude Benski, Secretary-General, Merlin Gerin, RGEIA2 38050 Grenoble Cedex.

GERMANY. Society for the Scientific Investigation of Para-Science (GWUP), Amardeo Sarma, Convenor, Postfach 1222, D-64374 Rossdorf (FAX: +49 6154 81912).

HONG KONG. Hong Kong Skeptics. Contact Rebecca Bradley, P.O. Box 1010, Shatin Central Post Office, Shatin, NT.

HUNGARY. Hungarian Skeptics, Janos Szentagothai, *Termeszet Vilaga,* P.O. Box 25, Budapest 8,1444. Fax 011-36-1-118-7506.

INDIA. Indian Skeptics, B. Premanand, Chairman, 10, Chettipalayam Rd., Podanur 641-023 Coimbatore Tamil nadu. **Indian Rationalist Association, Contact** Sanal Edamaruku, 779, Pocket 5, Mayur Vihar 1, New Delhi 110 091.

ISRAEL. Israel Skeptics Society, Philip Marmaros, Chairman, P.O. Box 8481, Jerusalem.

IRELAND. Irish Skeptics, Peter O'Hara, Contact, St. Joseph's Hospital, Limerick.

ITALY. Comitato Italiano per il Controllo delle Affermazioni sul Paranormale, Massimo Polidoro, Editor, *Scienza & Paranormale,* P.O. Box 60, 27058 Voghera (PV).

JAPAN. Iapan Skeptics, Jun Jugaku, Chairperson, 1-31-8-527 Takadanobaba, Shinjuku-Ku, Tokyo 169.

MEXICO. Mexican Association for Skeptical Research (SOMIE), Mario MendezAcosta, Chairman, Apartado Postal 19546, Mexico 03900, D.F.

NETHERLANDS. Stichting Skepsis, Rob Nanninga, Secretary, Westerkade 20, 9718 AS Groningen.

NEW ZEALAND. New Zealand Skeptics, Vicki Hyde, Chairperson, South Pacific Publications, Box 19-760, Christchurch 5, N.Z., Fax: 64 3 384-5138.

NORWAY. NIVFO, K. Stenodegard, Boks 9, N-7082, Kattem. **Skepsis,** Terje Emberland, Contact, P. B. 2943 Toyen 0608, Oslo 6.

RUSSIA. Contact Edward Gevorkian, Ulyanovskaya 43, Kor 4, 109004, Moscow.

SOUTH AFRICA. Assn. for the Rational Investigation of the Paranormal (ARIP), Marian Laserson, Secretary, 4 Wales St., Sandringham 2192. SOCRATES, Leon Retief, contact, 3 Hoheizen Crescent, Hoheizen, Bellville 7530.

SPAIN. Alternativa Racional a las Pseudosciencias (ARP). Javier Armentia, President, Apdto. 1516, 50080 Zaragoza. El **Investigador Esceptico.** Contact Felix Ares De Blas, G amezl Ares l Martinez, P. O . Box 904, 20080 Donostia-San Sebastian.

SWEDEN. Vetenskap dc Folkbildning (Science and People's Education), Sven Ove Hansson, Secretary, Box 185, 10123 Stockholm.

TAJWAN. Tim Holmes, San Chuan Road, 98 Alley, #47, Fengyuan.

UKRAINE. Perspective, Oleg G. Bakhtiarov, Director, 3-B Khmelnitskogo St., 252001 Kiev.

UNITED KINGDOM. SKEPTICAL INQUIRER Representative, Michael J. Hutchinson,10 Crescent View, Loughton, Essex IG10 4PZ. **The Skeptic** magazine, Editors, Toby Howard and Steve Donnelly, P.O. Box 475, Manchester M60 2TH. **London Student Skeptics,** Contact: Bill Harman, 21 Manville Rd., London SW17 8JW. **Manchester Skeptics,** David Love, P.O. Box 475, Manchester M60 2TH. Wessex

THE COMMITTEE FOR THE SCIENTIFIC INVESTIGATION OF CLAIMS OF THE PARANORMAL

Paul Kurtz, Chairman
Barry Karr, Executive Director

SCIENTIFIC AND TECHNICAL CONSULTANTS

George Agogino, Dept. of Anthropology, Eastern New Mexico University
William Sims Bainbridge, professor of sociology, Illinois State University
Gary Bauslaugh, dean of technical and academic education and professor of chemistry, Malaspina College, Nanaimo, British Columbia, Canada
Richard E. Berendzen, astronomer, Washington, D.C.
Martin Bridgstock, lecturer, School of Science, Griffith Observatory, Brisbane, Australia
Richard Busch, magician, Pittsburgh, Pa.
Shawn Carlson, physicist, Berkeley, Calif.
Charles J. Cazeau, geologist, Deary, Idaho
Ronald J. Crowley, professor of physics, California State University, Fullerton
Roger B. Culver, professor of astronomy, Colorado State Univ.
J. Dath, professor of engineering, Ecole Royale Militaire, Brussels, Belgium
Felix Ares De Blas, professor of computer science, University of Basque, San Sebastian, Spain
Michael R. Dennett, writer, investigator, Federal Way, Washington
Sid Deutsch, Visiting Professor of electrical engineering, University of South Florida, Tampa
J. Dommanget, astronomer, Royale Observatory, Brussels, Belgium
Natham J. Duker, assistant professor of pathology, Temple University
Barbara Eisenstadt, educator, Clifton Park, N.Y.
John F. Fischer, forensic analyst, Orlando Fla.
Frederic A. Friedel, philosopher, Hamburg, West Germany
Robert E. Funk, anthropologist, New York State Museum & Science Service
Eileen Gambrill, professor of social welfare, University of California at Berkeley
Sylvio Garattini, director, Mario Negri Pharmacology Institute, Milan, Italy
Laurie Godfrey, anthropologist, University of Massachusetts
Gerald Goldin, mathematician, Rutgers University, New Jersey
Donald Goldsmith, astronomer; president, Interstellar Media
Clyde F. Herreid, professor of biology, SUNY, Buffalo
Terence M. Hines, professor of psychology, Pace University, Pleasantville, N.Y.
Philip A. Ianna, assoc. professor of astronomy, Univ. of Virginia
William Jarvis, professor of health promotion and public health, Loma Linda University, School of Public Health
I. W. Kelly, professor of psychology, University of Saskatchewan
Richard H. Lange, M.D. Mohawk Valley Physician Health Plan, Schenectady, N.Y.
Gerald A. Larue, professor of biblical history and archaeology, University of So. California.
Bernard J. Leikind, staff scientist, GA Technologies Inc., San Diego
William M. London, associate professor of health education, Kent State University
Thomas R. McDonough, lecturer in engineering, Caltech, and SETI Coordinator of the Planetary Society
James E. McGaha, Major, USAF; pilot
Joel A. Moskowitz, director of medical psychiatry, Calabasas Mental Health Services, Los Angeles.
Robert B. Painter, professor of microbiology, School of Medicine, University of California
John W. Patterson, professor of materials science and engineering, Iowa State University
Steven Pinker, assistant professor of psychology, MIT
James Pomerantz, professor of psychology, Rice University
Gary Posner, M.D., Tampa, Fla.
Daisie Radner, professor of philosophy, SUNY, Buffalo
Michael Radner, professor of philosophy, McMaster University, Hamilton, Ontario, Canada
Robert H. Romer, professor of physics, Amherst College
Milton A. Rothman, physicist, Philadelphia, Pa.
Karl Sabbagh, journalist, Richmond, Surrey, England
Robert J. Samp, assistant professor of education and medicine, University of Wisconsin-Madison
Steven D. Schafersman, geologist, Houston
Béla Scheiber,* system analyst, Boulder, Colo.
Chris Scott, statistician, London, England
Stuart D. Scott, Jr., associate professor of anthropology, SUNY, Buffalo
Erwin M. Segal, professor of psychology, SUNY, Buffalo
Elie A. Shneour, biochemist; director, Biosystems Research Institute, La Jolla, California
Steven N. Shore, associate professor and chair, Dept. of Physics and Astronomy, Indiana Univ. South Bend
Barry Singer, psychologist, Eugene, Oregon
Mark Slovak, astronomer, University of Wisconsin-Madison
Gordon Stein, physiologist, author; editor of the American Rationalist
Waclaw Szybalski, professor, McArdle Laboratory, University of Wisconsin-Madison
Ernest H. Taves, psychoanalyst, Cambridge, Massachusetts
Sarah G. Thomason, professor of linguistics, University of Pittsburgh, editor of *Language.*

*Member of CSICOP Executive Council

CSICOP SUBCOMMITTEES

Astrology Subcommittee: Chairman, I. W. Kelly, Dept. of Educational Psychology, University of Saskatchewan, Saskatoon, Saskatchewan 57N 0W0, Canada.

Electronic Communication Subcommittee: Chairman, Page Stephens, 6006 Fir Ave., Cleveland, OH 44102. E-Mail: Jim Kutz aa387@Cleveland.Freenet.edu

Health Claims Subcommittee: Co-chairmen, William Jarvis, Professor of Health Promotion and Education, School of Public Health, Loma Linda University, Loma Linda, CA 93350, and Stephen Barrett, M.D., P.O. Box 1747, Allentown, PA 18105.

Parapsychology Subcommittee: Chairman, Ray Hyman, Psychology Dept., Univ. of Oregon, Eugene, OR 97402.

UFO Subcommittee: Chairman, Philip J. Klass, 404 "N" Street S.W., Washington, D.C 20024.

The Committee for the Scientific Investigation of Claims of the Paranormal

The Committee for the Scientific Investigation of Claims of the Paranormal encourages the critical investigation of paranormal and fringe-science claims form a responsible, scientific point of view and disseminates factual information about the results of such inquiries to the scientific community and the public. It also promotes science and scientific inquiry, critical thinking, science education, and the use of reason in examining important issues. To carry out these objectives the Committee:

- Maintains a network of people interested in critically examining paranormal, fringe-science, and other claims, and in contributing to consumer education
- Prepares bibliographies of published materials that carefully examine such claims
- Encourages research by objective and impartial inquiry in areas where it is needed
- Convenes conferences and meetings
- Publishes articles that examine claims of the paranormal
- Does not reject claims on a priori grounds, antecedent to inquiry, but examines them objectively and carefully

The Committee is a nonprofit scientific and educational organization. The SKEPTICAL INQUIRER is its official journal.